Development of an assessment tool to enhance order process performance for an e-tail fashion company

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Master's Dissertation

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Resumo

Nos últimos anos, verificou-se um crescimento abrupto na indústria de comércio eletrónico diretamente proporcional à competitividade a ele inerente. A rápida expansão deste mercado, levou ao aumento da complexidade dos processos, obrigando as empresas a reinventar as suas estrategias de forma a fortalecer o seu crescimento.

No entanto, o aumento da complexidade e do número de processos, num curto período de tempo, dificulta estruturação e consequentemente afetando a consistencia dos mesmos. Desta forma, existe uma necessidade crescente em melhorar os processos, redesenhando-os. A Farfetch, empresa onde o presente projeto foi realizado, faz parte da indústria de comércio electrónico, no setor de moda de luxo. O ritmo elevado de crescimento teve como consequencia o aumento das vendas. Como tal, tornou-se imperativo usar os dados e as ferramentas disponíveis para otimizar e simplificar os processos da empresa.

A presente dissertação visa desenvolver uma ferramenta de avaliação para melhorar o desempenho do processo de encomendas. Durante o processo de encomedas, ocorrem imprevistos que podem impactar o desempenho de uma loja tais como atrasos da transportadora, artigos danificados ou até mesmo preços mal cobrados. Assim, essas questões devem ser avaliadas e validadas, de acordo com regras pré-definidas. O processo em questão era executado manualmente e de forma destruturada. Como resultado, existiram várias oportunidades de optimização do processo, permitindo não só a sua automatização como tambem melhorar o desempenho da equipa responsável. A ferramenta foi desenvolvida com base na metodologia Business Process Management (BPM), permitindo uma avaliação completamente autónoma e eficiente do processo. Posteriormente, as ferramentas de visualização de dados foram desenvolvidas usando o software Tableau, refletindo os resultados da ferramenta e monitorizando todo o processo.

O modelo desenvolvido aumentou a visibilidade do processo, permitindo a rápida identificação de problemas através da constante monitorização de todas as váriaveis dependentes deste. A eficácia da ferramenta de avaliação desenvolvida foi corroborada pelas poupanças obtidas, não apenas a nível monetário, mas também operacional, permitindo o planeamento estratégico do processo e o alinhamento global das operações.

Abstract

In the last years, there has been an abrupt growth of the e-commerce industry, which is directly proporcional to the market growth. This quick expansion increased process complexity, as companies are constantly reinventing strategies in order to strengthen their growth.

Increasing the complexity and number of processes in a short period of time makes it difficult to structure processes and impacts their consistency. Thus, there is an emerging need to improve processes, by redesigning them.

Farfetch, the company where the present dissertation was carried out, is part of the e-commerce industry in the luxury fashion sector. As a consequence of the accelerated growth pace, there was a significant increase in sales. As such, it became imperative to use the data and the tools available to optimize and simplify the company's processes.

The present dissertation aims to develop an assessment tool to enhance ordering process performance. During the ordering process, there are unforeseen occurrences that can affect the performance of a boutique such as courier's delays, faulty items or even wrong prices. These issues must be evaluated and further validated, according to pre-established rules. The process was completely manual and without any structured standard. Therefore, there were several opportunities to improve and automate it, and consequently to improve the performance of the responsible team. The tool was developed based on the Business Process Management (BPM) methodology allowing a completely autonomous and efficient evaluation of the process. Afterwards, data visualization tools were developed using Tableau software, reflecting the tool outcomes and monitoring the whole process.

The developed model brought a clear visibility to the process, allowing the quick identification of issues through the constant monitoring of all the inherent variables. The effectiveness of the evaluation developed tool was corroborated by the savings achieved, not only at the monetary but also at the operational level, allowing for strategic process' planning and the overall alignment of operations.

Acknowledgments

After 5 academic years, a journey full of mixed emotions is coming to the end. The present dissertation is dedicated to all the ones that cross my path, and somehow supported me and helped me to achieve my goals.

To my parents and sister for all the love, support, and care.

To my grandmother for all food cooked with love that saved me thousands of times. To my faculty friends for sharing the best time of my life with me, since the best to the worst moments.

To all the professors that, in a certain way, shaped my path over here.

To my supervisor at FEUP, Prof. Isabel Horta, for all the shared suggestions during this dissertation.

To Gonçalo, Magda, Miguel, and Kathleen for all advice during the developed project.

To Supply team for all the support.

To Farfetch for giving me the opportunity to develop my dissertation in such an incredible company.

"Once you stop learning, you start dying."

Albert Einstein

Contents

Acronyms and Symbols

AWB	Air Waybill
BPM	Business Process Management
BPMN	Business Process Management Notation
CFP	Courier Failed Pickup
CS	Partner Service
DO	Double Order
FI	Faulty Item
IPD	Impossibility to Print Documents
IDP	Impossibility to Decide Packaging
IT	Information Technology
KPI	Key Performance Indicator
NPS	Net Promoter Score
NS	No Stock
OA	Order Already Picked Up
PPI	Product Packaging Issue
PS	Partner Service
SA	Suggest Alternative
SR	Size Recommendation
SLA	Service Level Agreement
SoS	Speed of Sending
UML	Unified Modeling Language
VBA	Visual Basic For Applications
WI	Wrong Item
WP	Wrong Price
WS	Wrong Size

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Chapter 1

Introduction

Online sales have been positioning themselves in the global retail world expecting an increase from 10.2% (2017) to 17,5% (2021), according to Statista (2018).

Representing 8% of the global online sales (Borland et al. (2018)), luxury goods are the core of Farfetch business. This market is constantly growing being expected an arise of 12 % in global luxury goods sales until 2025, hence, reaching 1/5 of the global luxury goods sales (Borland et al. (2018)) and so is Farfetch. However, the meaningful growth brings complexity and new demands.

At this point, it is crucial not only to structure the business, but also to ensure its scalability. Therefore, the processes must be readjusted to the needs of the business having a growth need for automatization.

This present project aims the standardization and further automatization of Exceptions' process , an internal company's process. Through the development of a dynamic tool for the improvement of the Exceptions' process and also to control and decrease the workload of the Supply Team.

1.1 Farfetch

Farfetch.com is a global online marketplace that bridges the physical gap between its partners, around 1200 boutiques and 10 brands of luxury fashion, and its potential customers around the globe in one platform. Founded in London, where it still has its headquarters, the company was launched in 2008 by José Neves and has been spreading strategic offices around the globe. Currently, Farfetch has around 2000 employees scattered across the 12 offices: Oporto, London, Guimarães, Lisbon, Hong Kong, Shanghai, Los Angeles, New York, Dubai, Moscow, São Paulo and Tokyo.

The motto of the company is to revolutionize the way the world shops for luxury goods through the most creative, exciting and diverse customer experience. The differentiating factor amongst the other e-commerce players is its business model. By controlling the process – from content

creation, until the item reaches customers' house - by assuring the post-sales customer service and by displaying one of the widest variety of products in the market.

All the online items are held by the partners and later packaged and shipped from the respective boutique, or warehouse using third part logistics (3PL) partners, therefore, Farfetch does not store inventory. This competitive advantage brings with it a lot of complexity and challenges to the business. Not only, it does exposes the company to the risk of stock out and create a dependency on the partner's performance to ship the orders on time, but it also increases the complexity of delivery. Nevertheless, it eliminates the holding costs, providing the company flexibility to scale and focus its workforce on improving all the supply-chain performance and logistic process.

There are 7 different departments working to assure the feasibility of the business in Farfetch Portugal, shown in figure 1.1: Merchandising, Account Management, Technology, Finance, Office Operations, Human Resources and Operations.

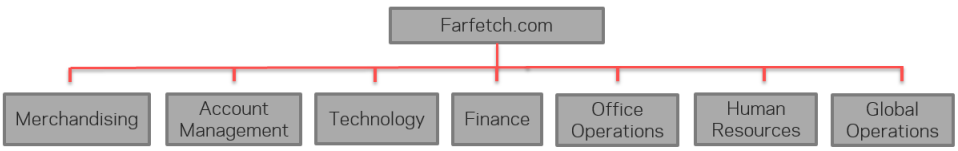

Figure 1.1: Farfetch's Structure

Merchandising and Account Management work daily with boutiques providing them the best support, not only to ensure their competitiveness and growing sales, but also to help them with operational issues. The sales forecast and the definition of the best product assortments is Merchandising responsibility while Account Management aims to optimize plans according to the boutique's needs.

The Technology department ensures the support of the back office (internal tools) and front office (website) by developing and improving the company's platforms, while Finance controls the company's cash flows. Office Operations and Human Resources are responsible for managing the office and for recruiting new people, respectively.

Finally, the Global Operations department, where this thesis was developed, is responsible for all operational tasks through the order and sales processes. In section 1.2 , this department will be analyzed in detail, explaining how it is divided and what the responsibilities of each of those teams are.

1.2 Global Operations Department

All the tasks related with daily e-commerce activities are responsibility of the Global Operations Department.

This department works hard to create standards that allow the company to deliver a consistent service while providing a luxurious experience. It is divided into 6 teams, as represented in the following figure 1.2: E-commerce Operations, Supply and Retail Logistics, Customer Excellence, Procurement, Operations Strategy and Creative Operations. These teams are structured, scalable and able to manage large volumes of orders and data.

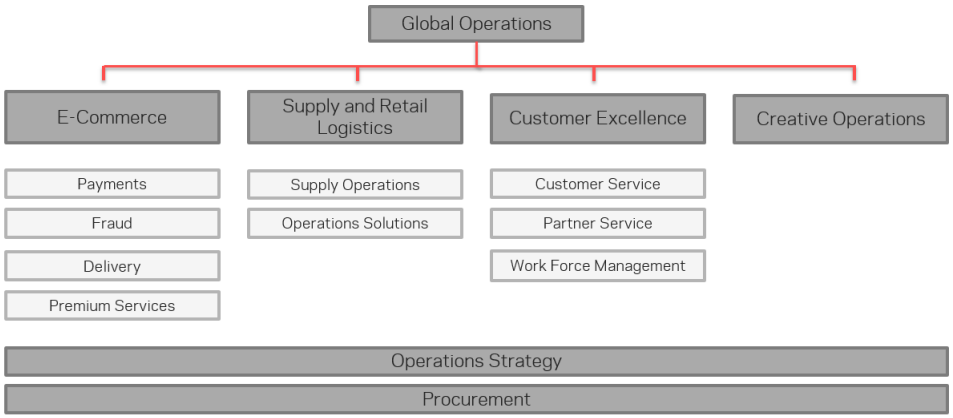

Figure 1.2: Global Operations Structure

Customer Excellence connects the company with partners and customers through Partner Services (PS) and Customer Service (CS) teams. Customer Service provides all customer support to guarantee customers' pre and post- order journeys satisfaction. CS has the challenging task to drive revenue through customer contacts. The goal is to make sure that the customer will shop again through the website by inspiring confidence. PS supports boutiques on operational issues and recommends strategic plans. The scheduling, planning and managing PS and CS performances are responsibilities of the Workforce Management team.

Creative Operations explores innovative ways to accelerate product online, improves the efficiency of the company product process and ensures the excellent service level to partners. This team photographs each item, controls its quality and identifies their materials and designation ensuring their availibity online.

Operations Strategy and Procurement are transversal to all the previous teams, working on the continuous improvement of processes along with all operations' teams and purchasing software and material to support teams, respectively.

Supply and Retail logistics are accountable for controlling the service level provided for the partners and for measuring their KPI's. Operations Solutions helps partners to set up their warehouse's layout and advises them with the best practices to achieve the targets. Supply Operations is the specific team where this project was developed. This team controls and measures the partners KPI's working alongside PS and CS teams and it is responsible for stock packaging management. Furthermore, the Supply Operations team is involved in all areas related to process improvement, providing to the Technology Department all the requirements for developing new back office tools, to facilitate and support operational teams.

1.3 Project Scope

With Farfetch's the continuous growth of and consequently its orders, it is extremely important to assure the proper flow of the supply chain, which can lightly impact the customer satisfaction and experience. As a result, the company's process performance is increasingly demanding, requiring redesigned processes to guarantee a healthy company growth.

Since an item is ordered, the order is processed on the website and automatically synchronized with an intern platform, where the ordering process begins. During this, some issues can occur, forcing the company to work with partners to solve them, avoiding further consequences. These issues correspond to exceptions in the order process. Exceptions represent deviations that happen throughout the process, which can change the normal path service. Internally, from the operational point of view, exceptions are a set of options available on the back office platform that allow boutiques to alert the responsible teams whenever an unforeseen situation prevents them from completing the ordering process. There are 13 different exceptions that boutiques can report and that will be further explored on chapter 3, section 3.3.5 .

Evidently, it is important to measure the performance of each partner, according to the company's service incentive, to assure the highest standards of customer experience. However, creating exceptions can have a negative impact on the boutique's performance. Thus, to avoid harming the company's partners, the Supply Operations team evaluates the time used to solve the situation and assesses whether it should be accounted for each boutique performance calculation or not.

Currently, the performance validation needs information from several sources and has a low level of automatization. All the process is done manually, with about 9000 exceptions per month arriving to the system and being handled one by one by the team. Afterwards, each exception is submitted for further financial analysis.

The purpose of this project is to redesign the exceptions' analysis process, building a tool capable of retrieving information from all sources and automatically analyze each exception through a dedicated model. It aims to increase the team responsiveness, the process accuracy and visibility through standardization, in addition to generating new reports and metrics to support the redesigned process.

1.4 Project Goals

The present dissertation has the intent to develop a tool with an appropriate model to automatize a current manual process in Farfetch. To do so, the following goals were established:

- Modeling and optimizing the exceptions' process;
- Automatizing the process, increasing the process accuracy and supporting the team decision making and also allowing the reduction of the supply chain team's workforce;

- Building dashboards to monitor the process and the tool's outcomes in order to assess the partner's behavior when creating exceptions enabling easier identification of patterns and issues.

1.5 Methodology

Considering the previously objectives, it is important to define a methodology that will drive the project to achieve the final goal. The 5 phases of the project will flow as it shows in figure 1.3:

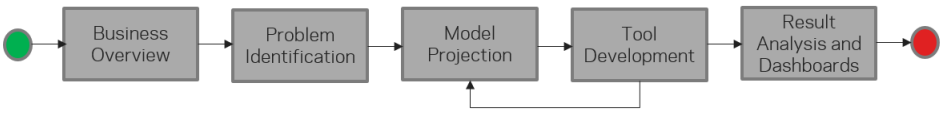

Figure 1.3: Project Methodology

First, it is important to perceive the company's business model, as well as understanding its most significant KPI's. After this, it is crucial to identify and deeply understand the current situation that comes along with the problem that triggered this project. Exception process mapping, standards identification and KPI's analysis are the tasks that will be ensured on 2nd phase.

The 3rd phase - Model Projection - is the main phase of this methodology, as the guidelines will be established for further testing and implementation. It is expected an analysis of the current processes, highlighting improvement opportunities and their re-design. Besides that, building an optimized tool to fulfill the range of requirements is extremely important, which will imply continuous and cyclic iterations until the guidelines fit the most of all the requirements gathered.

The tool's development will take place on stage 4, following the previously established guidelines.

Lastly, an analysis of the tool's outputs is performed and exhibited in dashboards that will allow to monitor, not only the process and the tool performance but also the partners' performance in exceptions' process.

1.6 Dissertation's Structure

The content of the present dissertation is divided into 6 chapters. Chapter 2 presents a literature review that combines the relevant subjects on the project development, including the e-commerce scope in luxury fashion industry, the Business Process Management and Modelling methodology and data visualization techniques.

Chapter 3, consists on a clarified view of the current handled processes and KPI's, pointing out its limitations, according with the scope of this project.

Chapter 4 covers the design of the current exceptions process, the respective re-design and also the development of the solutions to the tool.

Regarding the chapter 5, it focuses on results achieved with the implemented solution, presenting the final tool and the developed dashboards to support the process.

Lastly, the chapter 6 highlights the results of the project implementation and future work considerations to the resulting improvements.

Chapter 2

Literature Review

2.1 E-commerce scope in luxury fashion industry

The connection amongst trade and technology has subsisted and perpetuated for a long time. These days, the web has turned into an irreplaceable segment of individuals' lives (Jai et al., 2013), playing a powerful role in modern business (Okonkwo, 2009).

However, "There was no love at first sight between luxury and digital", quoting Heine and Berghaus (2014). It may not be evident why e-commerce was not embraced right away by luxury industry (Okonkwo, 2009). Nevertheless, it can be explained by the very core of luxury industry: exclusivity (Okonkwo, 2007) and controlled retail distribution to keep up a premium status (Keller, 2009).

Breaking a lot of paradigms and taking the risk of overexposure, while maintaining a fragile perception of the restricted offer (Okonkwo, 2009), the percentage of luxury goods online increased to 8% in 2016. Although, it is predicted that this number increases to 25% until 2025 (Borland et al., 2018).

More and more E-tail -electronic retailing- business becomes a customer-to-customer (C2C) reality, where buyers can, in one click, access a wide assortment of luxury goods, sharing their luxury e-commerce experience with other consumers around the globe. The increase in online luxury sales and digital influence generates demanding consumers, forcing this e-commerce segment to reinvent itself and to adapt their strategies and approaches to the newest channels of communication (Borland et al., 2018).

Nowadays, customers desire for multichannel deliveries, expecting an intimate service combined with a personalized experience (Kate McCarthy and Su., 2017). Big data and machine learning are creating opportunities to step up the relationship with each customer, thus taking their experience to the next level. Advanced analytics not only enable fast answer to changes on demand and to customer preferences but also highlight opportunities to incorporate tailored and authentic services for every customer and occasion(Borland et al., 2018).

Therefore, the luxury fashion industry should be, increasingly, aware of the continuous transformations on digital e-commerce, leveraged by advanced analytics in order to create chain value and empowering scalability businesses (Borland et al., 2018).

2.2 Business Process Management

Around the world, the constant economic, technologic and digital changes are affecting the way companies structure their businesses. More and more, companies are adopting process-oriented strategies to support the integration of their operations in the global business (Willaert et al., 2007).

A process is defined as a sequence of aligned activities and interactions carried out within an organization, with the purpose of producing a specific product or service. According to available resources and required information, a process can be characterized by its functional, behavioral, organizational and informational character (Bal, 1998).

Business Process Management (BPM) is a holistic approach that allows companies to structure their operations through their modeling, monitoring and analysis, highlighting opportunities for further improvements (Zacarias et al., 2017). Bridging the gap of knowledge-base between technical and business people, BPM enables process re-engineering through the implementation of continuous improvements, empowering the process optimization (Kluza and Nalepa, 2017).

Hereupon, BPM follows an iterative cycle as figure 2.1 shows and it will be explained bellow (Dumas et al., 2013).

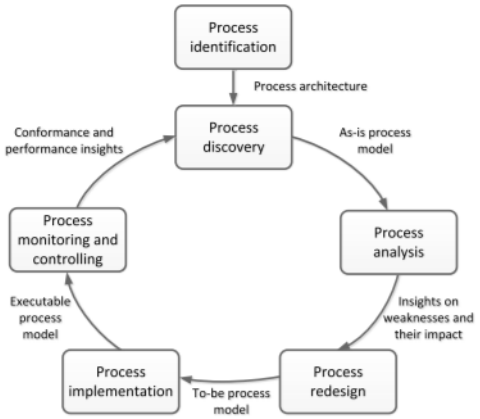

Figure 2.1: Business Process Management Life-Cycle. (Dumas et al., 2013)

The first step of BPM cycle is about problem identification. It comprises not only the relevant processes' problems identification but also a deep understanding of their scope. Then, linking the relations between the processes, it is possible to set up the process architecture, hence having an overview of all process. During this step, it is also crucial to measure the main outputs of the process, by defining performance metrics. Only by measuring the main performance indicators it

is possible to control the overall process' performance and to understand the impact of BPM in the process. Depending on the process, these measures can comprise costs, lead time, work time or even error rates. The potential outputs can also be measured in the process analysis phase.

Once the global process architecture is structured, it is possible to start the process discovery phase, covering the documentation of the relevant steps. One of the main critical tasks of BPM is to collect the information and knowledge-base to model the process flow and to define its rules. According to Friedrich et al. , it represents 60% of the time spent on process management projects (Friedrich et al., 2011). Then, business analysts leverage the know-how in the business process modeling to organize all the information gathered in one single process. Business Process Modeling is defined, by Boukadi et al. (2009), as a graphical approach of the process business flow and it will be analyzed in next the chapter 3. So, by analyzing the current processes and using business process modeling approaches, business analysts are able to model an AS-IS model, reflecting the picture given by the workers about how the process is currently done.

The third step of the BPM cycle consists of a deep analysis of the AS-IS model, highlighting non-valuable actions, weaknesses, bottlenecks, and opportunities to improve the current processes within companies. To do so, the business analyst must keep in mind the impact of the changes in the process, swinging with the expectable performance measure. Usually, the issues are documented according to their impact and the effort to solve them, prioritizing the ones with most impact and effort. After setting the modifications in the process, its re-design phase takes place. This following phase is focused on redesigning and remodeling the current process, with the aim to visualize a future improved scenario, designated as TO-BE model. As interactive process analysis and re-design may be, all the proposed changes that might come up while re-designing the process must be analyzed before moving on to the next step.

After the process re-design, the next step embraces the TO-BE model implementation. During this phase, there are two distinct tasks to perform: organizational change management and process' automation. On the one hand, there is always a strong resistance to change. To contradict this, it must be clarified the process' changes, to train process' stakeholders, according to the new paradigm, and to explain them the benefits of the process' implementation. Despite this being a hard task, stakeholders have a key role in the implementation phase, once they are the ones that are constantly testing the new processes and can identify easily its deficiencies. On the other hand, process' automation involves the implementation or configuration of IT systems in order to support the TO-BE process. The IT tool should be intuitive, assisting the users to easily perform tasks.

After the implementation phase, the process monitoring and controlling phase take place. There is always room for improvement, so this phase helps analysts to detect outliers that are not expected, according to the requirements. Then, the BPM cycle starts again to perform the accurate adjustments.

2.3 Business Process Modeling

As it was stated in the previous chapter 2.3, business process modeling is a graphical and visual approach that supports and accelerates software development, upholding the management improving decisions and analysis. The models must use an intuitive notation (Fjeldstad and Snow, 2017) being usually represented by maps, which are easily understandable to the stakeholders. These maps should show how the process flows, representing inputs and outputs, linking tasks and assigning people involved in them. Furthermore, it enables the process standardization, helping to reduce the process variability (von Rosing et al., 2015).

Process modeling can have various levels of detail. However, it should follow a top-down approach, by starting to map the process from a macro to a more detailed level (Anjard, 1996).

There is a wide range of notations used in process modeling such as a flowchart, functional flow block, Unified Modeling Language (UML) and Business Process Model and Notations (BPMN) (Saini and Thiry, 2017). Considering the scope of this dissertation it will be emphasized the BPMN notation.

BPMN is a standard and intuitive notation based on flowchart techniques bridging the communication lack between business process and business implementation. This notation has four basic categories: flow objects, that comprises events activities and gateways, connecting objects, swimlanes, and artifacts. Bellow, it will be exposed the main elements of BPMN as also their description and notation:

- **Events** - Represents a specif moment that occurs during the business process. It can be a start, ending or intermediate event.
- **Activities** - Set of atomic or composed tasks carried out in a business process such as tasks, sub-processes and call activities. On one hand, the tasks represent atomic activities representing a single unit of work. On the other hand, the sub-process represents a composed activity within a process that has a lower level process associated, and the call activity is a notation to reuse an activity within the process, or even in another process.
- **Gateways** - Used to control the logic flow, converging and diverging paths within the process. The most used are exclusive, inclusive and parallel. Exclusive is used to indicate alternative paths that can be followed. While, inclusive is used to create alternative paths based on a condition. It can be activated one or more conditions based on the process, however, the activated activities must be completed before merging. Finally parallel gateways are used to create alternative paths, however, all of them should be completed before merging.
- **Connecting Objects** - Used to guide the flow of the process by connecting the flow objects. There are 4 types of connecting objects: Sequence Flow, Message Flow, Association and Data Association. Sequence Flow guides the process by following the order of the activities, while Message Flow represents the exchanged messages between stakeholders. Otherwise,

Artifacts are used to associate artifacts to flow objects. Finally, Data Association associates data with flow objects, in order to show the inputs and outputs of the activities.

- **Swimlane** - It contains elements named pool and lane, figure 2.2 which represent actors and their roles in a business process, respectively.

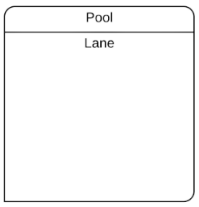

Figure 2.2: Pool and Lane

- **Artifacts** - Additional standardized information needed to understand and complete the process. It could be a annotation used to provide additional information and relevant notes of the process or data objects that represent data, singular and collections of objects, used in activities such as output or input. Group is another artifact that can be used to group activities that do not influence the process flow.

2.4 Data Visualization

BPM is divided into 6 phases, as it was presented in the previous chapter 2.3, where the last one is monitoring and controlling. Monitoring is a crucial phase in BPM life-cycle, allowing companies to measure the results of their goals considering their growing awareness regarding process performance (Weske, 2012). Therefore, it is needed to proceed with the creation of metrics that help to translate the process performance.

In order to monitor processes attending to the respectively established metrics, it is needed to develop reporting methods that directly extract data, displaying it in a clear and intuitive way. The most used tool for monitoring the process performance across companies is the dashboard. (Peral et al., 2017). A dashboard, according to Eckerson (2010) is a strategic management system that reflects the company's strategy results through performance metrics, which allow real-time monitoring and works as an enabler to potentialize stakeholder's proactive decisions, actions to improve and automatize processes. Defined as performance a management tool, by Yigitbasioglu and Velcu (2012), dashboards collect and organize data from a wide range of sources which allows the representation of process metrics in a summarized way, allowing the user not only to easily point out process anomalies but also to explore their limitations.

While structuring a dashboard, its visual and functional design features must be aligned, balancing data complexity with visual representation, in order to organize information in a more usable way. Thus, visual features are linked to how efficiently the information will be perceived by the user and how effectively it will be used in decision making. On the other hand, functional

features refer to dashboards functionalities such as filtering capabilities (Yigitbasioglu and Velcu, 2012).

Likewise, data visualization covers a wide range of areas, embracing a lot of data and insights from distinct fields. Hence, Fry (2007) suggests to divide the data visualization process into 7 stages: acquire, parse, filter, mine, represent, refine and interact.

- **Acquire** the data;
- **Parse** and structure the acquired data;
- **Filter** the relevant information;
- **Mine** the information by applying statistical and graphical methods to easily detect patterns;
- **Refine**, by engaging the information in a more visual way.
- **Interact**, by selecting methods enabling an intuitive manipulation of data and visible features.

Suitable data visualization provides a consistent analysis of the relationships between the analyzed data. The advantage of graphical representations over text-based reports is the capability to expose patterns and trends and spot potential issues. Contrarily, text-based reports do not present the information in a visual way, hiding the patterns and out-liers (Eckerson and Hammond, 2011).

Summing up, data visualization is a powerful tool that improves company processes and engagement. It supports upper-level management decisions by understanding cross functional capabilities that lead the company to profitable growth (Wind, 2005) and allocates the resources by strategically pinpointing continuous improvement opportunities (Lou et al., 2016).

Chapter 3

Problem Description

As previously mentioned in chapter 1, section 1.5 , the initial phase of the project's methodology focuses, not only on a business overview, but also on a general understanding of the main KPI's, highlighting the supply chain processes' flow and KPI's directly connected with the project of this dissertation. Therefore, to follow the stated methodology, it will be adopted an approach based on the BPM method. This chapter will cover the first step of BPM approach, "Process Identification".

3.1 Company's Interfaces

Almost all processes involved in this project are aided by one or more intern platforms, so it is important to know them and their applicability. There are three main platforms: STORM, SALES, and Zendesk.

STORM is a web-based application integrated with the boutiques' system that allows them to control the ordering flow, manage daily tasks (such as ordering process, stock management, and returns) and report current issues.

On the other hand, SALES is only managed and used by Farfetch Teams. This web-based application contains all the information about the ordering process, production process, delivery scheduling and all the detailed information about boutiques. Furthermore, it is also on SALES that exceptions are managed and where there is almost all information needed to evaluate them.

Moreover, these two platforms run slowly, increasing the team's answering times and prejudicing their performance. This constitutes a problem that with new upgrades and by automatizing some of the processes might be solved.

At last, Zendesk is the official communication tool for Farfetch's Customer Service. It is an interface that allows not only external communication - between boutiques and Farfetch teams or customers-, but also enables internal communication.

There are 3 different Zendesk platforms: Delivery Zendesk, Partner Service Zendesk, and Customer Service Zendesk. The communication is established creating messages - tickets in Zendesk glossary -, assigning them to agents that have the task to inform boutiques, solve the ticket or even communicate with the customer if it is required. The tickets are managed first in first out (FIFO) by the teams and all the company's communications are done through them.

3.2 Ordering Process

As a marketplace, Farfetch links the customer to the boutique. Once the item is purchased on the company's website, the order is placed on STORM and, consequently, the ordering process starts, flowing as it shows in next figure 3.1.

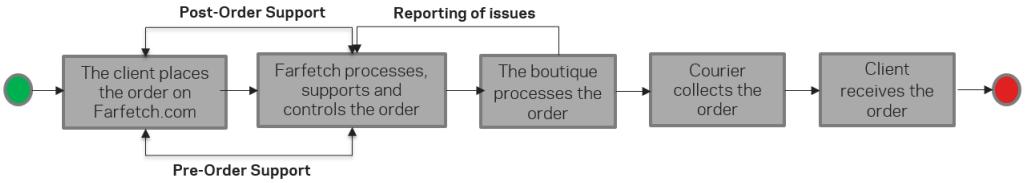

Figure 3.1: Ordering Process Overview

Currently, the ordering process is divided into 6 steps, as shown in figure 3.2: Check Stock, Approve Payment, Decide Packaging, Create Shipping Label (Air WayBill), Ready to send and Send. Therefore, even process numbers are company teams' responsibility, whereas odd numbers are boutiques' responsibility.

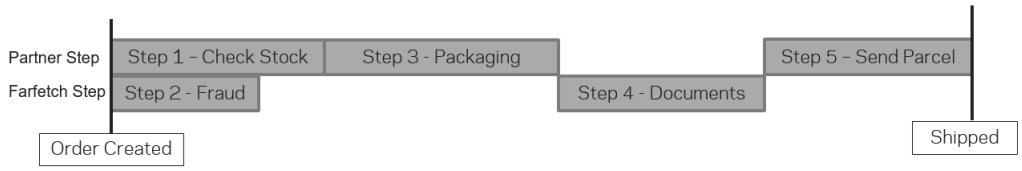

Figure 3.2: Steps of Ordering Process

The ordering steps will be explained in detail below:

Step 1 - Check Stock

The first step starts when the order is placed on STORM until the item availability is confirmed by the boutique, as shown on figure 3.3. For this reason, it is important to alert the partners to the importance of checking the exact stock to avoid compromising the continuity of the ordering flow. Most of the company's partners are boutiques that, besides selling their luxury goods online, also sell them physically - in other words, offline. Despite keeping track of the boutique's stock level, the system synchronization is not done instantaneously. This means that offline shopping can

happen between the moment that the order is placed on STORM and the moment that the online update of stock is done.

This is called a “no stock“ situation. Intending to solve it, the system will look for the item in another boutique, swapping it without the customer noticing, hence creating a new order and canceling the previous one. However, Boutiques can also suggest an alternative item to the customer avoiding the “no stock” situation.

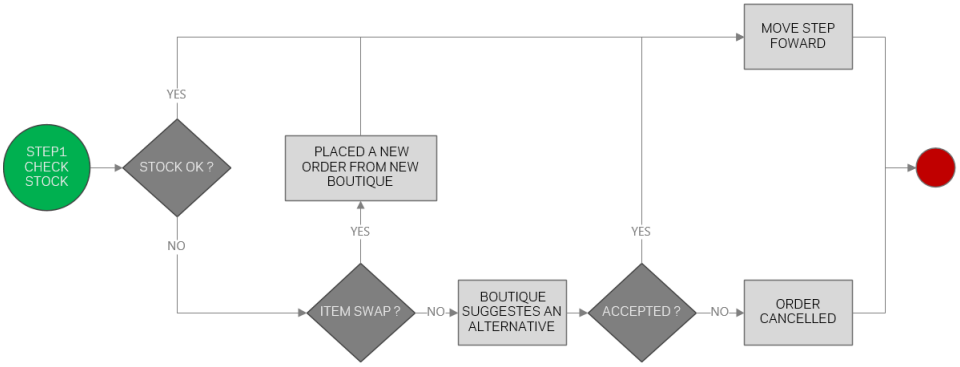

Figure 3.3: Step1-Check Stock

Step 2 - Approve Payment

Parallel to the first step occurs the second one -Approve Payment-, the responsibility of the Fraud Team, represented on figure 3.4. Moreover, 95 % the orders are approved before Step 1 is completed. According to their behavior regarding the payment system, customers are distin-

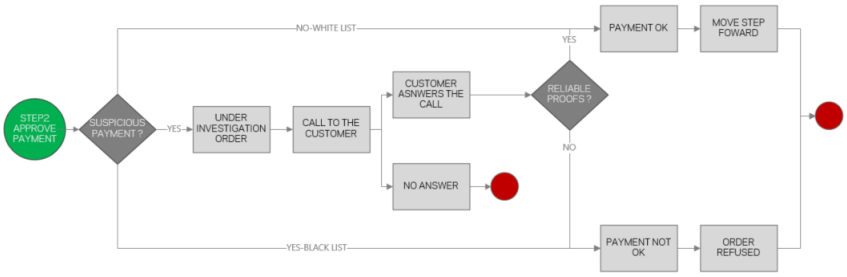

Figure 3.4: Step2-Approve Payment

guished generating two lists: Black List and White List. On the one hand, White List Customers are those who have a confirmed, secure and reliable payment source (among other aspects). On the other hand, Black List Customers are those who cause problems with the payment process, usually with a distrustful payment source. This means Farfetch has an updated report of the previous customers and can immediately and automatically reject or accept an order by consulting the previously mentioned lists.

Beyond the orders from Black and White List Customers, that are automatically accepted or rejected by the system, the Fraud Team also needs to deeply analyze the new customer’s order origin, the payment source, and other relevant aspects in order to prevent a potential fraud. As a

result of crossing the data with previous payments to identify standards and possibilities of being fraudulent payments, some payments are directly rejected or accepted. In some cases, it can be necessary to directly contact the customer to request a Proof of Billing by phone.

When the order is not reliable, the fraud analysts cancel the order, reporting the reason for cancellation and adding the suspect to the Black List.

Step 3 - Decide Packaging

In Step 3, boutiques have the responsibility to match the proper packaging to the item ordered, selecting it on STORM, as it shown on figure 3.5. During this step, Boutiques should package the item according to the selected packaging, adding customized details such as a handwritten postcard or a luxury wrapping paper, thus guaranteeing a luxurious customer experience.

Farfetch advises the boutiques about the better packaging for each item, however, boutiques may set a new box if it is required. All boxes are designed by the company, but boutiques are responsible for managing and ordering their own packaging stock since it is provided by an external company.

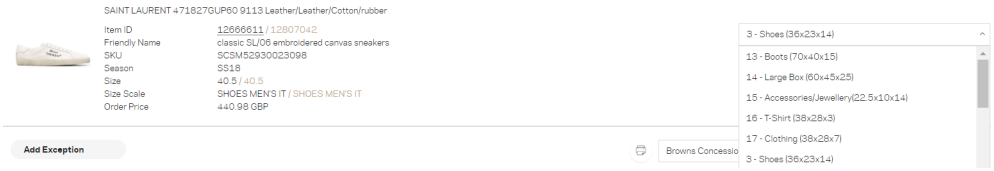

Figure 3.5: Step3-Decide Packaging

Step 4 - Air WayBill (AWB)

The shipping label and the AWB are created in Step 4 and it is automatic unless there is any problem with the shipping information or legal restrictions that have to be handled by the Delivery team. Usually, 95% of the orders take less than 2 hours to pass Step 4.

Step 5 - Send Parcel

As the shipping label is ready, the order is pushed forward to Step 5 to be collected by the courier. When the boutiques have a considerable amount of orders per day, they are assigned a daily pick up service. However, some boutiques do not have enough orders to justify daily pick up, so the system books the pickup automatically, usually for the next day. Once the courier scans the package, the order is moved to Step 6.

Step 6 - Sent

From the moment the courier scans the parcel, until it is received by the final customer, the order is in transit, on Step 6. Once the parcel is scanned, the company sends a confirmation email to the customer, distinguishing the time spent to process the order by the boutique and the estimated time that will be spent by the courier to deliver the order.

3.3 Key Performance Indicator (KPI's)

After understanding all the ordering process' steps, it is also important to identify the KPI's that define the partner's performance. The Speed of Sending (SoS) and No Stock (NS) are the measured performance KPI's and have, naturally, a direct impact on the customer's experience. Furthermore, it is likewise to refer Net Promoter Score (NPS), the KPI that measures the customer's satisfaction and that is transversal to the whole company. Keeping those KPI's in mind, internal goals were established monthly and will be further explained below.

3.3.1 Speed of Sending (SoS)

The Speed of Sending (SoS) is a Key Performance Indicators (KPI) that measures the time elapsed since an order is forwarded to the boutique until the courier collects the package. Taking into consideration the ordering process, there are two types of SoS: Speed of Sending Gross and Speed of Sending Net. The Gross SoS represents the total time, counting from the moment an order is placed by the customer, until the time the order is collected by the courier's company, as equation 3.1 shows. It takes into consideration all the time spent during the first 5 steps of the ordering process, even the ones that are not controlled by boutiques. Moreover, it does not take in consideration weekends and holidays. Considering that boutiques, generally, only work from Monday to Saturday and courier companies just until Friday, this metric becomes an unfair performance indicator.

$$Gross\ SoS = Scan\ Courier\ Date - Order\ Creation\ Date \tag{3.1}$$

Consequently, the company developed the Net SoS KPI, represented on equation 3.2, that excludes from Gross SoS the time spent on actions that boutiques do not control, i.e payment verification (step 2) , AWB details confirmation (step4), weekends, holidays and occasions where the order may be held by external boutiques factors.

$$\begin{aligned} Net\ SoS = [&Time\ spent\ on\ 1 + Time\ Spent\ on\ step3 + Time\ Spent\ on\ step5] \\ -[&Time\ Spent\ on\ Weekends + Time\ Spent\ on\ Holidays + Time\ Spent\ on\ Hold] \end{aligned} \tag{3.2}$$

Therefore, Net SoS KPI is the most accurate way to measure the boutique's performance. Internally, it is represented as a percentage (%) of the orders shipped in less than two days, constituting the Service Level Agreement Speed of Sending Net (SLA SoS), as seen on next equation 3.3.

$$SLA\ SoS = \frac{Total\ Number\ of\ Orders\ with\ SoS\ <\ 2}{Total\ Number\ of\ Sent\ Orders} \tag{3.3}$$

Besides preserving the excellence standards of the company, a good SLA is also a competitive

advantage against other boutiques. Accounting that the same item may exist in more than one boutique, the company defines rules that prioritize which item will appear first on website.

3.3.2 No Stock

Another metric related to partner's performance is the No Stock (NS). It represents the percentage of items canceled by boutiques due to a lack of stock on a total of items sold by the month. This metric has a big negative impact on customer experience, meaning a lot of times a lost sale. For this reason, the company is highly demanding on this KPI.

Like SoS, there are also Gross No Stock and Net No stock. No Stock Gross is calculated based on all items canceled and the alternative suggestions accepted by the customer when the boutique declares no stock and suggests an item. On the other hand, Net No Stock is calculated only on items canceled. For instance, if one boutique sold 100 items, with 3 of them canceled by a no stock reason and 2 alternative suggestions were accepted by the customer: Gross NS=5% and Net NS = 3%. The calculations are shown below on equations 3.4 and 3.5.

$$Gross\ NS = \frac{Number\ of\ canceled\ items + Alternative\ Suggestions\ Accepted}{Total\ Number\ of\ Sent\ Orders} = \frac{2+3}{100} = 5\% \tag{3.4}$$

$$Net\ NS = \frac{Number\ of\ canceled\ items}{Total\ Number\ of\ Sent\ Orders} = \frac{3}{100} = 3\% \tag{3.5}$$

3.3.3 Net Promoter Score (NPS)

Once the order is delivered, the customer receives a short quiz about the purchased item and the service provided.

This quiz consists of five questions where the customer can evaluate his/her experience. There are three questions directly related to the service provider, classifying the service provided by the boutique, order packaging and the speed of the delivery, each being evaluated up to 5 points.

The remaining questions are related to the customer feedback about the company and the boutique that provided the service. In contrast with the previous ones, the customer must classify the answer up to 10 points. The answers are scored in three groups: Detractor (0-6 points), Passive (7-8 points), Promoter (9-10 points), assuming that detractors will not purchase again and promoters will recommend Farfetch. NPS measures the difference between the number of promoters and detractors, as expressed on equation 3.6.

$$NPS = \frac{Number\ of\ promoters - Number\ of\ Detractors}{Total\ Number\ of\ Quiz\ Answered} \tag{3.6}$$

3.3.4 Service 3.0

As competition gets fierce and customers even more demanding, the company needs to ensure that standard services are scalable and maintained.

Service 3.0 is an incentives and penalties operational excellence program designed for achieving higher service levels and taking customer service to the next level. Besides, it aims to speed up the ordering process, forcing boutiques to improve their performance and processes. As a result, the service considers the SoS, NS, wrong item rule and returns of each boutique, monthly.

Incentives and penalties are managed as a result of the boutique's KPI's performances. The ranges of incentive defined by the company, according to the KPI, can be seen in 3.1 and 3.2, respectively.

Table 3.1: Rules of SoS according to Service 3.0

Incentive	Net SoS <1 [days] and Packaging Rate [a] >= 4,5	Packaging costs are covered by Farfetch.
Neutral	1<Net SoS < 2 [days]	No penalty or incentive.
Negative	Net SoS >2 [days]	The boutique is accountable for supporting the shipping cost of that order to the customer.

[a] On post-purchase survey customer rates the packaging and boutique must achieve the higher classification.(0/5)

Table 3.2: Rules of NS according to Service 3.0

Incentive	No Stock <= 0,75 % + compliance with Wrong Item[a]	Farfetch waives the monthly Free Return Fee [1 % of the total sales of the boutique] , however, the boutique has to pay the compensation customer voucher for the canceled orders.
Neutral	0,75 % <No Stock <= 3 % + Non-compliance with Wrong Item rule	Accountability for the compensation vouchers to the customers who get their orders canceled.
Negative	No Stock > 3% + more than 3 items cancelled due to no stock that month	The boutiques waive 10 % of the item's value

[a] *Wrong Item Rule –Represents the % of return items due to wrong size, damage or item on total amount of returns accepted every month. This rule established the % of wrong items that are acceptable to compliance the wrong item rule policy.

To better manage their own service performance, boutiques receive a daily report with the results achieved on the previous day. These reports contain the Net SoS of each order and a list of returns pending and contested. At the end of the month, the company sends a financial report detailing all targets achieved and not achieved, according to the Service 3.0. In opposition to SoS performance, that reflects the transactions of the current month, No Stock and Free Returns Contribution Charge reflect the transactions of the previous month.

3.3.5 Exceptions

Exceptions are a set of options available on STORM that are not only are used for boutiques to report unexpected situations that occur during the ordering process, but also to avoid penalties on the speed of sending. Currently, 3% of the total number of orders have at least one exception. Consequently, operations teams are pressured to work fast to solve them, to minimize the impact on the customer's experience.

To cover all unexpected situations, there are 13 exceptions distributed for the 3 steps controlled by partners. The description of each exception and respective steps are presented on table 3.3, placed in the end of the present sub-chapter.

The general exceptions' process flow is represented in figure 3.6.

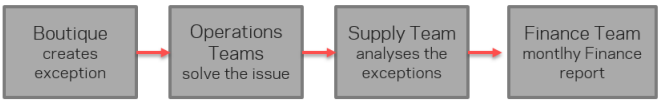

Figure 3.6: Exceptions Process Flow

Since the order is placed on STORM and according to each the situation, the boutique must create an exception. This exception represents a doubt or a potential issue that will be later solved by the respective responsible team: Partner Service, Customer Service or Delivery. After this, the order is ready to be pushed one step forward to step 6, where it is collected by the courier company.

As the Net SoS KPI does not consider the time spent on problem resolution, the Supply Team must recalculate it, discounting the time spent on solving it, changing the range of the performance of each order, according to Service 3.0 rules. However, not all cases are meaningful and trustworthy. Therefore, each order must be analyzed by the Supply Team, who has the hard and ambiguous task to validate each created exception and to assign the root cause of the problem to the company or respective boutique. Whenever the fault is held by the company, the time spent on the exception resolution that prevents boutiques to move the order flow forward is calculated by a Supply Chain team member, demanding the SoS recalculation. Aftewards, the right range must be assigned, according to service 3.0 : positive, negative, or neutral, as shown on figure 3.7.

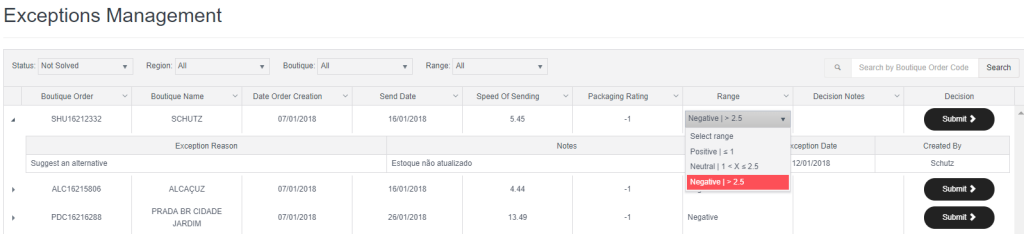

Figure 3.7: SALES Exception Management

Despite changing the range, the boutique SLA SoS is never changed by the exception decision.

Table 3.3: Exceptions' Description

Exception	Description	Steps
Double Order (DO)	It should be used whenever boutiques receive a new order that contains exactly the same items as a previously placed one, in some minutes time.	Step1 Step3
Suggest an Alternative (SA)	It enables boutiques to suggest an alternative item in case of no stock, thus avoiding the cancellation for no stock. However, the algorithm always looks first for the required item in another boutique before suggesting an alternative to the customer. The difference between the suggested item and the selected one should be cover by the boutique.	Step1
Wrong Item (WI)	Boutiques should use wrong item exception whenever the photo or description does not match with the item ordered. Consequently, boutiques can offer a discount or suggest an alternative to the customer.	Step1 Step3
Wrong price (WP)	Boutiques should use this exception whenever the tagged price is not right or in case of any doubt about the taxes and duties applied.	Step1 Step3
Discount for imperfect item (DII)	Boutiques should create this exception if the ordered item has a small defect, it is missing the tag, there is a small damage on the box or any other possible defect. In this case, it is required a detailed description of the defect and a photo that proves the reliability of the item and the discount to offer.	Step1 Step3
Faulty item (FI)	Boutiques should use this exception whenever the item is not up to luxury standards. Consequently, it has to provide an estimated time to ship the new item or suggest an alternative if the customer rejects the shipping delay.	Step1 Step3
Size recommendation (SR)	There are some items that don't fit the true to tagged size (for example, a specific brand might consider a medium size what the majority of the other brands consider that same size a small). For this reason, boutiques should report the situation alerting and advising the customer to a better matching size.	Step1 Step3
Wrong Size (WS)	Wrong size and size recommendation don't report the same issue. Wrong size should be used every time the ordered item size scale is different from the one used by the boutique.For example, a 34 size in Europe corresponds to a 6 Size in the UK, although boutiques may not be aware of this conversation scale.	Step1 Step3
Product Packaging issue (PPI)	It must be created every time boutiques ran out of packaging materials.	Step3
Impossibility to decide packaging (IDP)	This exception should be used to report STORM problems during the validation of step 3, preventing the selection of proper packaging.	Step3
Impossibility to print Documents (IPD)	This exception should be used to report STORM problems during Step 5, in cases that boutiques have to wait for paperwork or if invoice information is eligible.	Step5
Order Already Picked up (OAP)	Boutiques should report this situation when the order was already picked up, but it still appears on STORM. However, they should wait until the next day in case of possible scan delay synchronization on the courier's side. Otherwise, it should be reported.	Step5
Courier Failed Pick up - DHL/UPS Failed Pick up (CFP)	Boutiques must report whenever the courier does not collect the order on the expected date. For this, boutiques should be aware of their collecting system, having two possibilities: manual or daily. The difference between the two is that a daily pick up happens everyday, while a manual pick up must be scheduled for at least one day after the order is received. This means that, in a manual collecting system, the boutique must always be aware of the expected collecting date before reporting the exception.	Step5

So, monthly boutique's SoS KPI will remain the same, even the ranges change. This means that the selected range is only worth it for the service of incentives and penalties and the Net SoS for each boutique is not adjusted to its real performance.

An order has a positive range whenever the order's Net SoS is less than 1 day, negative if it is higher than 2 days and otherwise considered neutral, as it is possible to consult on table 3.1, in the previous sub-chapter 3.3.4. The incentive program applies to each order, according to the ranges it is inserted in. This means that orders with positive range are accepted without prior analysis, since the interval will no longer change regardless of the impact of the exception. Contrarily, neutral and negatives ranges require a detailed analysis. Once submitted, it will take part of the monthly finance report, where penalties and incentives will be discriminated, according to Service 3.0. Apart from the range and time spent to analyze and submit each exception, it is important to keep in mind that all the submission process is manual, requiring workforce.

After understanding the scope of the exceptions on the ordering process, it is crucial to quantify the real problem by measuring it. First, to understand the real impact of exceptions on the ordering process, it is necessary to know not only the percentage of total orders with exceptions, but also which type of exceptions are more frequently used by the partners.

Considering the Pareto analysis below, in figure 3.8, there is a significant discrepancy attending the type of exception. Pareto Principle supports that 80% of effects come from 20% of the causes. In this specific case, means that 80% of the created exceptions are a consequence of 3 exceptions - *Order Already Picked Up*,*Courier Failed Pickup* and *Impossibility to print documents* -, representing a considerable volume of the total number of orders.

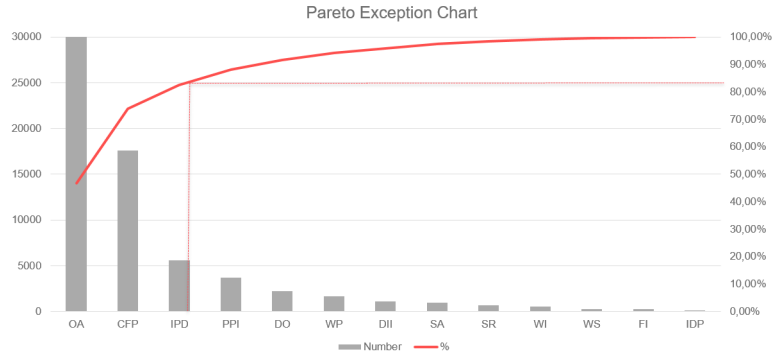

Figure 3.8: Pareto Exceptions' Chart

Once identified the most created exceptions, it becomes fundamental to understand which boutiques are creating them the most. Segmenting the boutiques according to the number of orders per semester, it ensures that 12 % of the smaller boutiques' orders have an exception created, against 3% of orders with exceptions from the biggest boutiques. As supported by figure 3.9, the trend is growing from the smaller boutiques to the bigger ones. This can be explained due to the lack of support and information towards smaller boutiques, since they create exceptions, oftentimes, without a valid issue.

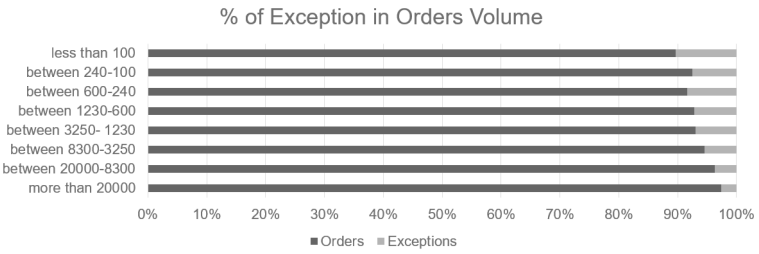

Figure 3.9: % of Exceptions in Boutiques Orders Volume

Chapter 4

Proposed Solutions

Understanding the scope of the company's business and identifying the main processes allows to start a deep analysis of the problem, design its possible solution and implement it. Continuing to follow the stated methodology, this chapter will cover the problem identification, model's projection and tool development, which concerns "Process Discovery", "Process Analysis", "Process Re-design" and "Process Implementation" according to the BPM approach.

4.1 Exceptions Process Mapping

Providing an insight into the process, the process mapping enables an efficient identification of the process weaknesses by guaranteeing an effective visual representation. Thus, highlighting potential improvements to the process.

Since exceptions' management process was an unexplored area, the lack of information, documented and mapped processes did not allow an immediate evaluation of the current processes. So, to get a clearer grasp of it, all processes were mapped before any evaluation. After designing all the current processes, named AS-IS mapping, the process was redesigned originating the TO-BE mapping.

Regarding the current processes design, since the process was completely manual and performed by different people, the information gathered, through interviews with workers, proved to be insufficient to structure the AS-IS process. Consequently, it required two weeks of manual work to perform the processes according to workers' instructions, to adjust and to collect enough information to build the most accurate process map.

After completing the process flow analysis, the next step was to group the exceptions according to their approach and map the current process. Thus, the exceptions were divided into two groups: Zendesk Exceptions and Delivery Exceptions. Zendesk exceptions are the ones that are previously processed by the PS team namely *Double Order*, *Wrong Item*,*Wrong Price*, *Discount for Imperfect Item*, *Faulty Item*, *Size Recommendation*, *Suggest an Alternative*, *Wrong Size*,*Product Packaging*

Issue, *Impossibility to decide packaging* and *Impossibility to print documents*. On the other hand, Delivery Exceptions are related with the exceptions that correspond to courier issues, covering the *Courier Failed Pick Up* and *Order Already Picked Up*.

As a result of an overview of the current process supported by the AS-IS maps, the main weaknesses were reviewed to determine methods to redesign and improve the process, which are:

- **The process is completely manual.** Despite being manual, which is already a big limitation on the process, there a lot of different interfaces used, decreasing the efficiency and increasing the time spent on it.
- **Lack of standardization.** There is no mapped process with a clear vision of the procedure, so each team member is analyzing exceptions the way that they think is most efficient.
- **SLA Net SoS is not accounted in the final monthly report.** Although Net SoS also changes, it is not accounted for on the SALES platform, as the only parameter that is updated is the range of incentive. This means that, even though a boutique is not affected financially by the incentives/penalties program, it may cause them to lose exposure on the website (and consequently to reduce its sales) due to the unchanged SoS value.
- **Lack of information and visibility.** Boutiques are not conscious of how and when to create an exception.
- **The process is dependent on the 3PL.** Besides not controlling all the information flow, the company's process success is also dependent on external companies, which turns out to be a great weakness.
- **Double check and duplicated work.** The lack of standard communication between internal company teams forces the Supply team to double check PS and CS work and to take, sometimes, inaccurate conclusions.

Considering the named weaknesses of the AS-IS process, new standards procedures and rules were redesigned to solve them through process efficiency and agility for a further model development.

So, gathering all the information in one interface and pointing out the important information for the exceptions analysis was the main concern. Considering this, the number of sources will be reduced to two: Sales Exception Management, where the exception's range is changed and the exceptions are submitted, and the tool, where it will be placed all the required information for the exception analysis.

Another challenge of the TO-BE process mapping was the development of fair metrics to recalculate the SoS, according to the output situation. Always considering the weekends and holidays between this time. In addition to enabling the Supply Team to recalculate the range with a constant metric, the new mapping will also support the model development.

Summing up, by following the stated rules of process mapping, it is possible to figure out the final output, the root cause of it and recalculate the new SoS. Until the final mapping was

completed, it was required an extended period of testing and investigation with the analysis of thousands of exceptions to detect exceptional cases that were not being considered. It required almost two months of intensive work to map all the exceptions processes and to redesign them. The following sub-chapters will describe in detail the AS-IS and the TO-BE of the Delivery and the Zendesk Exceptions.

4.1.1 Delivery Exceptions

Representing the most frequently used, the Delivery Exceptions should be introduced in the system whenever a boutique faces a courier problem. Therefore, boutiques should create an exception such as *Courier Failed Pick Up* or *Order Already Picked Up*, whenever the courier failed the pickup, or when an order is not scanned at the exact moment it is shipped, respectively.

However, it does not mean that these exceptions are always used with the right purpose by boutiques. Sometimes, an exception is created due to a lack of information or just because a boutique is trying to avoid penalties in SoS. So, the aim of the Supply Team is to analyze and understand the real scenario and determine if it was a misjudged situation, or if there was an justified issue with the courier. Furthermore, since this part of the process depends on a 3PL company, it is difficult to control their performance and to assure the most accurate information about the parcels' flow, compromising the effectiveness of the company's operations and weakening the Supply Team analysis.

Following some pre-defined procedures, it is possible to understand the root cause of the exceptions. By checking several sources and crossing the log dates, it is possible to achieve a solution output that categorized as either *No Farfetch's Fault* or *Farfetch's Fault*.According to this, the first step is to identify the meaningful information and where to consult it for further analysis.

Recapping the final part of the ordering process, chapter 3, Step 5 is the one that bridges the boutiques and the couriers. Since the order reaches the Step 5, it is ready to be collected by the assigned courier. Once Farfetch's system is integrated with the courier's system, as soon as Step 3 changes to Step 5 the pickup will be scheduled instantly. Depending on the courier and on the number of daily orders, can be assigned two distinct pickup services: daily or manual pickup. In case of a large volume of orders, daily pickup service assures that every working day, within the same time range, the courier will come to collect all the processed orders, so the system's scheduled date and time are the same, by default, as in Step 5. On the other hand, in case of a non-considerable amount of orders, manual pickup service schedules the pickup, usually, for the working day after Step 5's confirmation. Then, the courier should collects the order by scanning the label inside the store, synchronizing it with the company's system at the exact time of the parcel collection. Since Step 5, until the synchronization of the scan log, boutiques can create one or more exceptions.

Summing up, the essential information to retrieve about the final part of the ordering process are the assigned courier for the pickup, the type of pickup (daily or manual), the date and time of

Step5, the Step6, the exception and the scheduled pickup. Another additional important information to retrieve during the courier's pickup is the pickup point of the order's collection. A boutique can have several pickup points, from warehouses to other boutiques related with the "mother" boutique.

To gather all this information, the Supply team must rely on different sources. However, in spite of using the same information, the rules and procedures that are considered to analyze each one of the named exceptions are distinct. Therefore, a distinct map was created for each process which will be explained in the following sub-chapters.

4.1.1.1 Courier Failed Pick Up

Current Process Mapping - AS-IS

The figure 4.1 represents the only valid reason why boutiques should use this exception, meaning that the courier did not collect the order in the scheduled day. Considering this, the supply team has to check if the created exception has the right purpose, according to the information and the observations retrieved, as it represented in the AS-IS model appendix A.1, figure A.1 .

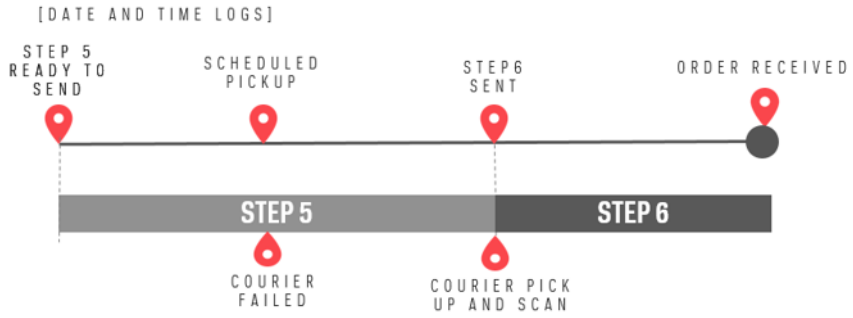

Figure 4.1: Courier Failed Pick Up

Firstly, since the information is overspread, the Supply team must access 4 different interfaces: Sales Orders Management, Cube, Sales – DHL Pickup and Sales Exceptions Management.

Starting the analysis' procedure, *No Farfetch's Fault* is automatically assigned if the order is shipped before the created exception. If not, the process is divided into two different paths according to the pickup service: daily or manual. In case of a daily pickup, by checking all the orders during that day it is possible to know if the courier collected any order or not and, in case the courier did collect, at what time. Thus, if the courier collects at least one of the boutique's orders, it will be assigned as *No Farfetch's Fault*, as the remaining orders could have been collected, if the boutique had prepared them on time. Orders created after the scheduled pickup time are also included in *No Farfetch's Fault*, as they will be picked up the next day. With the manual pickup service the process is similar, however, the Supply team must check the courier's activity on the respective boutique's scheduled pickup day, instead of on the Step5 day. Otherwise, if the exception was correctly created, it is assigned as *Farfetch's Fault* and the Supply

Team must readjust the range according to the time spent on the exception's resolution, without using a specific tool.

Redesigned TO-BE Process Map

By analyzing the current rules, it was considered that the rules did not cover all the situations that can eventually happen, namely the ones that include weekends and holidays. Furthermore, the previous standard rules did not standardize the SoS calculation. The next following procedures could be clarified by consulting the TO-BE *Courier Failed Pickup* mapping, in appendix A.1, figure A.2 and A.3.

The couriers' companies do not collect orders during the weekends or during holidays, however, some boutiques are open during these days. Since manual pickups are always scheduled taking the country, the local holidays and the weekends in consideration, only the analysis of the daily pickup service orders is affected. Since a daily pickup service is assigned to an order, the team should check if there were orders sent during the expected pickup day. However, in opposition to what happened in the AS-IS mapping, if there were not any orders sent during the expected date, the Supply team should check if the respective Step 5 date corresponds to a working day, a holiday or a weekend. In case of being a weekend or a holiday, they must check if the order was sent during the next working day, after Step 5 date and, if not, recalculate the respective SoS.

Relatively to the manual pickup service, the main difference to the previous procedure are the artificial holidays. Artificial holidays are bank holidays inserted in the database to cover situations where there are a great amount of orders affected by a sporadic problem caused by the provided Farfetch's service. Creating a bank holiday, Farfetch not only avoids a huge amount of exceptions, but also protects all the orders from being harmed by the occasion. Despite also affecting daily pickup service, the artificial holiday can mean the root cause of a manual pickup exception, once in daily pickup service the pickups are only scheduled for working days. So, by checking if the order was shipped during the next working day after the artificial holiday or not, it is possible to understand if the courier failed or not, respectively.

Regardless of the pickup service, whenever a failed pickup is verified it is assigned *Farfetch's Fault* to the exception. However, the metrics used to recalculate the SoS are dependent on the pickup service as it shows the next table 4.1.

Table 4.1: *Courier Failed Pickup* metrics' recalculation

Pickup Service	**Discounted Time**
Daily	Δ = [Step6 Date]-[Step5 Date]
Manual	Δ = [Step6 Date]-[Pickup Date]

Similar to the AS-IS model, *No Farfetch's Fault* is assigned when is when the courier does his job correctly, verifying the pickup in the expected day independently of the pickup type, and the boutique fails to prepare the package. This means the boutique did not process the order and, consequently, it will only be picked up on the next working day.

4.1.1.2 Order Already Picked Up

Current Process Mapping - AS-IS

The following figure 4.2 illustrates the only situation where the boutiques should report that the order was already picked up whose the mapped respective process can be consulted in in appendix A.2, figure A.4 .

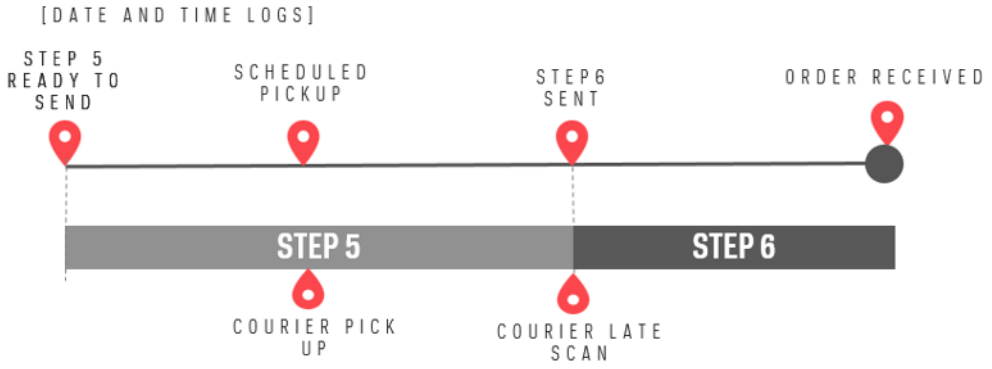

Figure 4.2: Order Already Picked Up

As concluded earlier, since Farfetch cannot fully control the information provided by the couriers, these specific exceptions are harder to analyze in an accurate way. In addition to some synchronization problems that can occur, the courier can also pickup the order and forget to scan it or even lose it.

Due to the complexity of this exception, this process demands a 6 source consultation: Sales Exceptions Management, Sales DHL Pickup, Sales Order Process, Courier's Website, Google Maps and the table's database with SoS Discount.

When analyzing this type of exception, if the exception date is after to the shipping date, the output is automatically set as *No Farftech's Fault*, explained by a courier's synchronization delay.

In case of a different scenario, the team has to check the courier's website to confirm if the stock point matches the shipping point on the courier's website. This enables the team to understand if the difference between the created exception date and the send date results from a difference in location, using Google Maps. If it matches, the next step is to verify if the time is already considered in the exceptions calculation, discounting the respective time from the order's SoS if the time was not considered. Otherwise, the time must be deducted, recalculating the exception's range.

The lack of standardization reflects a huge variability in the process output, especially in *Order Already Picked Up* exceptions, where the use of external sources that the company cannot control – e.g. Google Maps and the courier's website - makes this process very inconsistent and dependent on the person who is accountable to analyze the exception.

Redesigned TO-BE Process Map

Similar to *Courier Failed Pick Up*, the AS-IS mapping of *Order Already Picked Up* did not cover all the eventual situations that can occur. Despite using two completely external sources, previously, the exploration of the data base enabled to conclude that it is possible to access all the courier's scans, hence, accessing to the named stock point. So, Google Maps and the courier's website could be replaced by these data. Moreover, the database's table with the time already discounted in certain boutiques will not be consulted, once this information only influences the SoS recalculation.

By eliminating the external company's sources, it was possible to map the process considering that all information could be consulted in a single place, as it is possible to consult in in appendix A.2, figure A.5 . The description of the mapping outputs are below.

By analyzing a considerable amount of exceptions, it was detected that, in some orders, the exception date was created before the step5 date. This means an anomaly in the order flow -"system bug"- once delivery exceptions can only be created after Step 5. Consequently, whenever it happens the team must to evaluate individually each order to decide its output.

Depending if the exception was created during the scheduled pickup day or not, the process takes different analysis. In the first case, it must be analyzed if the scheduled pickup hour is previous to the courier's collection during that day. Despite not being the most accurate way to predict what happened, whenever the courier collects during the expected date, it will be assigned *Farfetch's Fault*, meaning there was a delay associated to the order courier's scan.

Otherwise, whenever the exception is created after the scheduled pickup date, the team must analyze the orders shipped during the exception day creation. Once there is not enough information available, allowing to understand if there was an delay order process by the boutique or not, to accurately evaluate this cases, the company decided to attribute *Farfetch's Fault* to every doubtful situation, hence, covering the possible costs. It also must assign *Farfetch's Fault* whenever the boutique sent the order earlier than predicted.

The *No Farfetch's Fault* will be assigned, whenever there were not collected orders during that day or the pickup scheduled hour is posterior to the courier's collection, meaning that boutiques should have used *Courier Failed Pick Up* instead of *Order Already Picked Up* .

The metrics to recalculate the SoS, in this situation, are represented in the following table 4.2.

Table 4.2: "Order Already Pickup" metrics' recalculation

Situation	**Discounted Time**
Exception's Date = Pickup's Date	Δ = [Step6's Date]-[Scheduled Pickup's Date]
Exception's Date <> Pickup's Date	Δ = [Step6's Date]-[Exception's Date]
Order sent earlier	$\Delta = [Step6's Date] - [Exception's Date]$

4.1.2 Zendesk Exceptions

Current Process Mapping - AS-IS

Regarding Zendesk exceptions, these represent operational issues that come up during the ordering process. Contrary to delivery exceptions, the analysis of Zendesk exceptions' is dependent on an assessment by PS team.

Every exception created appears in the PS Zendesk, according to the issue, and it is up to the team to solve the boutique's issue even to clarify them about the Farfetch's processes by exchanging messages through the team's Zendesk. After this, the exception created has to be validated by the Supply team in order to understand if the situation justifies a SoS recalculation or not. To do so, the Supply team must access the team's Zendesk and read the exchanged messages to understand the meaning of them. Thereupon, the team must decide if the range should be adjusted or not.

However, the PS team do not have any standard procedures, so the content of the messages is not always clear. The language varies depending on boutique's location and sometimes there is no content at all in the Zendesk's messages. These factors make the analysis of the exceptions' causes even more difficult, contributing to the inaccuracy of the procedures. The mapped process can be consulted in in appendix A.3, figure A.6 .

Redesigned TO-BE Process Map

Once the main limitation of Zendesk exceptions' AS-IS process was the lack of standardized information provided by PS team. So, by retrieving this information the Zendesk exceptions could be solved quickly, only requiring the SoS recalculation.

To solve the problem, there were scratched two possible solutions. The first was to create standardized sentences indicating if the created exceptions were or were not company's fault. However, this solution will require a lot of workload, since in addition to writing different sentences, it would also prevent PS team to close a huge amount of exception in bulk. So, it was studied the possibility of introducing a combo box in the PS Zendesk interface, enabling the PS agents , not only, to choose the right output for the exception *Farfetch's Fault* or *No Farfetch's Fault* but also to submit exceptions in bulk. Thus, considering that all the ticket information could be retrieved instantly and in a standardized way, it would only be necessary to calculate the SoS creating proper rules. The mapping of Zendesk Exceptions can be consulted in in appendix A.3, figure A.7.

Despite being assigned *Farfetch's Fault*, if the order is sent during the same day as the exception creation, the SoS will not be impacted.

Considering those that have an impact in the SoS result, if the problem was not resolved two hours before the courier's pickup, preventing the request from being sent during that day, it will be discounted one working day in the SoS result. This happens because it is considered that the order could have been shipped if the exception was resolved by the PS team in time, which assumes the fault and protects the boutique from being penalized. On the other hand, if the exception was

solved two hours before the pickup or the exception day is not the same as the exception solving day, the SoS will be recalculated considering the hour where the boutique moved one step forward. The metrics to recalculate the SoS in case of Zendesk exceptions' are listed in the next table 4.3.

Table 4.3: "Zendesk Exceptions'" metrics' recalculation

Situation	Discounted Time
PS Problem Solving Delay	Δ = 1 working day
Order pushed forward first than ticket solved	Δ = [Step's Date]-[Exception's Date]

4.2 Redesigned Process's Implementation

The next step of the project is the implementation of the redesigned solutions. Thus, according to the requirements, it is necessary to develop a tool that will support process. In addition to the model development, it was also necessary to implement the combo box in PS Zendesk and to gather all the scattered information in one platform.

Since the tool will be used by the Supply team members, it should be intuitive and user friendly, using also a program known by them. As a result, it was selected Microsoft Excel, since it enables the connection with the data base and facilitates the data manipulation.

4.2.1 Zendesk Combo Box

The implementation of this new functionality in the PS Zendesk required the involvement of two teams: PS and Workforce Management. By solving the ticket, the PS agent has a complete perception of the situation and knows what should be assigned to each exception - *Farfetch's Fault* or *No Farfetch's Fault* - in the most accurate way. The following figure 4.3, shows the PS Zendesk' interface where the "Farfetch's Fault?" field was implemented. As a result, PS team has to select "Yes" or "No".

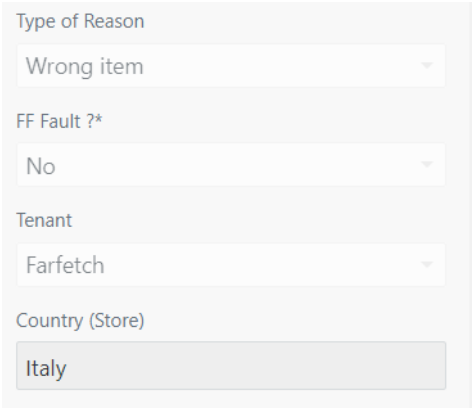

Figure 4.3: "Farfetch's Fault ?" field in PS Zendesk

However, the new field on Zendesk's interface meant a procedure change on the tickets' solving process. Once the team managers were resistant to change whenever it meant the execution of extra tasks by their teams, it required a period of negotiation by highlighting positive outcomes, not only for the exceptions process but also for the PS team. Exposing the complexity of the current exceptions analysis, the following advantages were presented and validated by the PS Team Manager:

- **Decreasing the boutiques claims by improving the exceptions accuracy.** The PS team is the one that works directly with boutiques, hence being responsible for answering boutiques whenever they face penalties by a wrong exception analysis. So, the additional field in Zendesk not only would improve the exceptions accuracy but would also decrease the time wasted trying to solve the claims.
- **Standardization of the exceptions' process.** Since it enables the automatization and standardization of exceptions. The PS team would not only get visibility of the process, but would also be able to clarify and alert the boutique for the exceptions' best practices according with the model outcomes.
- **Decreasing the time wasted by eliminating the double check.**The delay on the evaluation of exceptions and, consequently, the SoS recalculation, have a negative impact on boutiques financial reports at the end of the month. Despite not being a PS concern, the exceptions' automatization would guarantee that all exceptions would be evaluated during the day after being created.

However, it was required one month of training, by providing proper guidelines and support. Changing procedures and paradigms implies a hard task, requiring communications skills to motivate the workers and to make them feel like they belong to the project, which, in the end, can have a huge positive impact for the company.

Regarding to Workforce Management team, their role was to implement a mandatory field with the two options:*Farfetch's Fault*and *No Farfetch's Fault*.

4.2.2 Gathering Information

Farfetch has two huge databases, bixpl and bidw, with millions of data, scattered by different tables which, consequently, adds complexity to the gathering information process. While bixpl is updated in real-time, bidw is only updated once a day and the information is treated before going live.

Using the Structured Query Language (SQL) Server, it was possible to retrieve the information at once and in real time, using queries. However, there were some issues when joining all the information required in one single query, once the information relative to the SoS belongs to a different database. Despite being possible to connect two different databases, the process would

become really slow. So, there were developed two main queries to cover the information of the exceptions' analysis, also developing, in parallel, auxiliaries' queries to support the analysis of the TO-BE mapping, such as all the courier pickups, holidays.

Regarding the exceptions' main query, it uses the information from 16 different tables, gathered from the bixpl database, and has 36 different columns that help the exceptions' analysis. This query covers all the information connected with the order process such as steps' dates, type of exception, boutique and stock point, courier details, time spent in holidays, time already discounted in SoS and ticket details in case of Zendesk's exceptions. The following diagram, figure 4.4, represents all the used tables and the connections between them.

In addition to the large number of tables in database, which makes the searching information process lengthy, the lack of columns names' consistency and the use of different languages also hindered the SQL Query construction. As an example, two distinct field names can have the same mean - eg: LocalID and Site ID , CountryID and PaisID, ShipType and ServicoID.

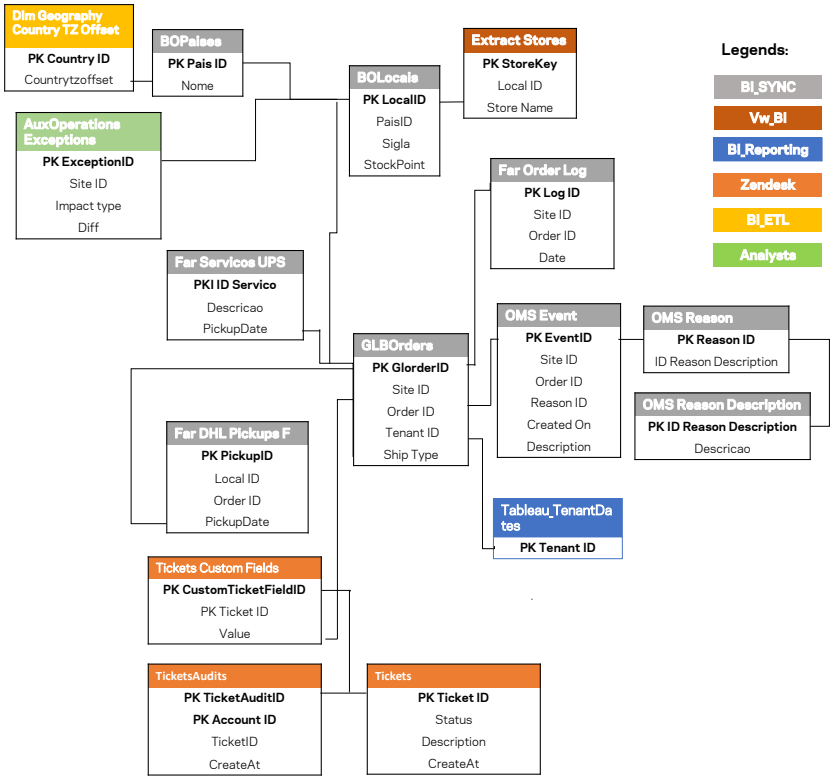

Figure 4.4: Exceptions Query Diagram

The main challenge here, in addition to finding the accurate and correct data, was to adjust all the dates to the Coordinated Universal Time (UTC), once dates can appear in the local time or in the company's system time (which corresponds to Portugal's local time).

Regarding the SoS query, it only required one table from the bidw database, where it was possible to retrieve all the information related with SoS metrics and calculation. In the appendix

B are presented the main queries used: Exceptions and SoS Query.

Microsoft Excel was the chosen work tool to gather all the information, once enables the direct data extraction from the database using the Power-Pivot add-in. Used to perform advanced data analysis and to create data models, Power-Pivot enables, among others, to export and manipulate data from a different database to excel, using queries. Moreover, it provides dynamic data updating, also allowing to schedule the refreshment of data.

4.2.3 Exceptions' Model Automatization

The exceptions' rules were automatized using the Visual Basic for Applications (VBA) language, by using the Developer add-in in Excel. Considering the previous mapped rules there were created three distinct functions, for each group of exceptions and another to calculate the time that should be discounted from the SoS.

The calculation function is dependent of the exceptions' analysis function output. Considering this, firstly it is crucial to understand which the main outputs are and how to reach them. According to the mapped rules, the algorithm must compare the exception's orders with all the orders shipped during a specific date by a certain courier, also considering the holidays. In order to do so, there were created two auxiliary tables, also extracted from the database, comprising the data from all the company's shipped orders and all the national and regional holidays of each country, respectively. Therefore, the output function is reached by crossing the data from the exceptions' query with auxiliary tables.

The algorithm outputs define the way the new SoS is calculated. Once, the current SoS already considers the weekends, holidays and time already discounted, the new SoS calculation must include this time in the discounted time calculation to avoid the double discount of time during the considered period, as it shown in the following equation 4.1.

$$Discounted\ time = \Delta - [Weekends] - [Holidays] - [TimealreadyDiscounted] \tag{4.1}$$

According to the developed function, each algorithm's output will set a distinct SoS recalculation. The following tables - table 4.4, table 4.5, table 4.6 outputs tabled bellow along with the respective deducted time.

Table 4.4: Courier Failed Pickup Outputs'

Courier Failed Pickup		
Outputs	**Description**	**Discounted Time**
Courier Failed D	Courier failed the pickup and the boutique's courier service is daily.	$\Delta = [Step6Date] - [Step5Date]$
Courier Failed M	Courier failed to pick up and the boutique's courier service is manual.	$\Delta = [Step6Date] - [PickupDate]$
Not Ready	The courier has collected orders during the scheduled pickup day or expected date and did not do it in this specific boutique. Therefore, the boutique did not prepare the order on time.	–
Ignore	Exception created after sent day or exception created during a weekend or holiday and order was sent in the next working day.	–
Will Come	Late order process, the step5's date is after the courier pickup, so the order will be collected on the next working day.	–
Collected	Order collected in the same day as the exception's creation.	–

Table 4.5: Order Already Picked Up Outputs'

Order Already Picked Up		
Outputs	**Description**	**Discounted Time**
Courier scan out of time E	Courier's scan delay on the exception's creation day.	$\Delta = [Step6Date] - [Step5Date]$
Courier scan out of time P	Courier's Scan delay on the pickup day.	$\Delta = [Step6'sDate] - [Exception'sDate]$
Discount Time	Order with manual pick up service sent earlier than the scheduled hour.	$\Delta = [Step6'sDate] - [Exception'sDate]$
Ignore	Order shipped in the same or in the previous day of the exception's creation.	–
System Bug	Exception created before step5.	–
Wrong Exception	The courier failed pickup, therefore, it should be used another exception.	–

Table 4.6: Zendesk Outputs'

Zendesk Outputs'		
Outputs	**Description**	**Discounted Time**
Step1 or Step3	Step1 or Step3 exception, respectively.	$\Delta = [Step(1/3)'sDate] - [Exception'sDate]$
Between Pickups	Whenever the order is not sent because of a solving delay.	$1 working day$
Step5	Zendesk Step5 exception.	$\Delta = [Step6'sDate] - [Exception'sDate]$
No Farfetch's Fault	PS assigned the fault to the boutique.	–
Ignore	Order process moves forward without PS intervention(eg. Weekends, holidays) or the order is shipped during the same day of the exception's creation.	–
No Feedback	PS change the ticket category, hence, the visibility of the exception output is lost.	–

Chapter 5

Final Outcomes

Once the proposed solutions were implemented, the next step was to monitor and control it according to established metrics. Furthermore, to support the dynamic monitoring of the Exceptions Management Tool and to complement the analysis of the tool outcomes in a visual way, there were developed dashboards. According to BPM, this chapter will approach the last stage of the cycle "Process Monitoring and Controlling", representing also the last phase of the stated methodology in chapter 1.5.

5.1 Exceptions Management Tool

Using the developed queries and model, it was possible to build an assessment tool with all the information updated in real time. The tool's main purpose was to automatize the exception's analysis. However, this tool also works as a consulting database for the exceptions, where the Supply team can directly access all the information related to a specific order. To make the tool user-friendly, a main menu was created, figure 5.1, where the user can quickly navigate through the available information and also access to the process dashboards. Furthermore, it also has usage instructions expediting the tool utilization.

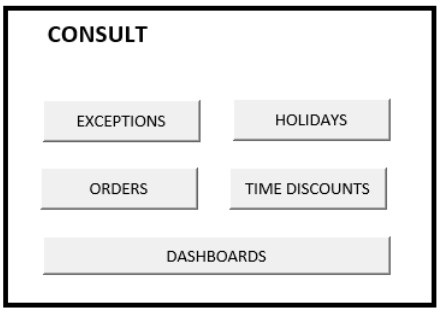

Figure 5.1: Exceptions Tool Main Menu

The holidays, orders and time discounted are query menus. On the other hand, the exceptions

management menu not only contains all the information about an exception order, but also automatically parses the exception, providing an output and recalculating the new SoS. Therefore, the user only has to change the range of SALES according to the new SoS and submit it. The exception management menu can be seen in the following figure 5.2.

OrderCode	StoreName	StockPoint	Exception	DATACRI	D_STEP1	D_STEP3	D_STEP5	D_exceptio	lStep6	D_pickup	FFFAUL	SOS	Zendesk Ex	Delivery Exc
40026401402	400M2	400M2	Order already picked up	25/05/2018	25/05/2018 10:08	25/05/2018 10:09	25/05/2018 10:09	05/06/2018 16:40	07/06/2018 09:37	25/05/2018 16:00		9,27	--	COURIER SCA
58M25666864	58M	58M	Size recommendations (siz	29/04/2018	02/05/2018 11:35	02/05/2018 11:35	02/05/2018 11:35	30/04/2018 09:28	02/05/2018 17:40	02/05/2018 11:35		1,78	step1	-
58M25791699	58M	58M	Wrong item	04/05/2018	07/05/2018 16:18	07/05/2018 16:19	07/05/2018 16:19	07/05/2018 09:41	07/05/2018 17:51	07/05/2018 16:19	no	0,90	NOFFFAULT	-
58M26277563	58M	58M	Wrong size	21/05/2018	25/05/2018 12:22	25/05/2018 12:28	25/05/2018 12:28	22/05/2018 09:23	25/05/2018 17:40	25/05/2018 12:28	no	3,78	NOFFFAULT	-
58M26515517	58M	58M	Wrong Association (descri	28/05/2018	05/06/2018 11:36	05/06/2018 11:37	05/06/2018 11:37	29/05/2018 09:55	05/06/2018 17:21	05/06/2018 11:37	no	5,91	NOFFFAULT	-
A4425645381	ART HAUS	ART HAUS A4	Courier failed pick up	29/04/2018	29/04/2018 09:31	29/04/2018 09:32	29/04/2018 09:32	30/04/2018 09:20	03/05/2018 04:19	30/04/2018 09:00		2,51	--	COURIER FAI
A4426214470	ART HAUS	ART HAUS A4	Wrong Association (descri	19/05/2018	22/05/2018 04:33	22/05/2018 04:33	22/05/2018 04:33	21/05/2018 11:53	23/05/2018 04:24	23/05/2018 09:00	no	2,52	NOFFFAULT	-
A4426214470	ART HAUS	ART HAUS A4	Wrong Association (descri	19/05/2018	22/05/2018 04:33	22/05/2018 04:33	22/05/2018 04:33	21/05/2018 11:53	23/05/2018 04:24	23/05/2018 09:00	yes	2,52	step1	-
A4426722904	ART HAUS	ART HAUS A4	Faulty item	04/06/2018	05/06/2018 11:25	05/06/2018 11:26	05/06/2018 11:26	05/06/2018 11:05	06/06/2018 04:21	06/06/2018 09:00	yes	1,71	step1	-
A4426748027	ART HAUS	ART HAUS A4	Faulty item	05/06/2018	06/06/2018 10:41	06/06/2018 10:42	06/06/2018 10:42	05/06/2018 11:06	07/06/2018 03:19	07/06/2018 09:00	yes	1,88	step1	-
AAI26353233	AMORE	AMORE AICHI	Impossibility to print docur	23/05/2018	24/05/2018 02:21	24/05/2018 02:51	24/05/2018 02:51	24/05/2018 06:08	25/05/2018 08:07	24/05/2018 16:00	yes	1,56	step5	-

Figure 5.2: Exceptions' Management Menu

The exceptions rules are materialized in Excel functions where the users can fill the required fields by themselves, making the tool easier to use. Despite being easy to use, the tool must be visual and intuitive. Thus, highlighting the main dates, the menu becomes easier to read. Likewise, the conditional formatting in the SOS column points out the range where the SoS is inserted in. Each distinct circle matches the Service 3.0 ranges, represented in table 3.1, chapter 3. The red, yellow and green correspond to a negative, neutral and positive range, respectively, thus making the filtering task by range easier. The new SoS column has three different signs. The check signal shows that there is nothing unusual with the recalculation. The exclamation mark represents an alert to the user whenever the order SoS is higher than 4. Lastly, the x signal represents an order with a negative new SoS, meaning that the database does not have enough data to recalculate the SOS or there is some particularity in the SoS calculation.

Furthermore, the exceptions' tool enhances the process providing a wide range of the tool's advantages for the daily routine of Supply team, listed below:

- Assist the management decision making;
- Reduce the process inaccuracy;
- Provide clear visibility of the exception processes, by allowing easy access to the information in real time;
- Arrange data in visual and intuitive way;
- Streamline the data manipulation due to filter capabilities;
- Improvement of process consistency;
- Decrease the lead time of exceptions submission;
- Decrease the time execution of the exceptions;
- Decrease the process' workforce.

5.1.1 Tool Tracking Metrics

Monitoring the tool not only assures its reliability but also its efficiency. By establishing metrics, it will be possible to increase the visibility of the tool's performance and its savings. The 3 selected metrics are listed below:

- Tool automatization;
- Costs Savings per week;
- Workforce Allocation.

Automatization

The Automatization metric translates the tool's accuracy, representing the total amount of exceptions that are analyzed automatically. The ideal scenario would be a tool accuracy of 100%, however, as it was stated during the process description, the exceptions process depends on the PS team that indirectly impact the tool performance. Also, some exceptional issues can occur, preventing the SoS's accurate recalculation, influencing, in some cases, the output analysis. Limiting the tool's performance and demanding manual analysis, these situations that decrease the tool efficiency and accuracy are listed below:

- **Lack of PS Team's Feedback.** Once the fill of the "Farfetch's Fault" is the only way to automatize the analysis of Zendesk exceptions, the percentage of absent answers has a negative impact on the process efficiency. Despite field of "Farfetch's Fault" being mandatory, when the category is changed that field information is lost, hence Supply team must to check it manually. However, this situation has been reduced by training the PS team.
- **Lack of data.** Some orders do not have complete information in the database, such as the pickup or step dates, limiting the SoS recalculation and the exceptions' analysis.
- **Order reprocess.** Whenever the delivery team pushes back step5 due to labeling problems, the system does not reschedule the pickup. So, the scheduled pickup date is not the real one, implying an inaccurate recalculation.
- **System bug.** Every time a system bug happens, it is not possible to recalculate the SoS automatically.
- **Time zone issues.** The lack of time zones synchronization compromises the accuracy of SoS, since there are countries with more than one time-zone, such as Australia. These cases tend to happen during weekends or holidays.

In order to calculate the total accuracy, the total number of exceptional events on the total number of exceptions orders must be considered, as shown in the following equation 5.1.

$$Accuracy = \frac{Number\ of\ unforeseen\ issues}{Total\ Number\ of\ Orders} \tag{5.1}$$

Thus, the accuracy equation, represented in the previously mentioned equation 5.1, monitors the percentage of automatization per week by establishing an average target of 90%, as it shows in figure 5.3. According to the factors that impact the tool's automatization, the improvement can be explained by a better collaboration of the PS team and the iterative process consistency iteration. Moreover, the automatization metric will allow the easier detection of issues in the tool's performance and it will also be used to calculate the remain metrics.

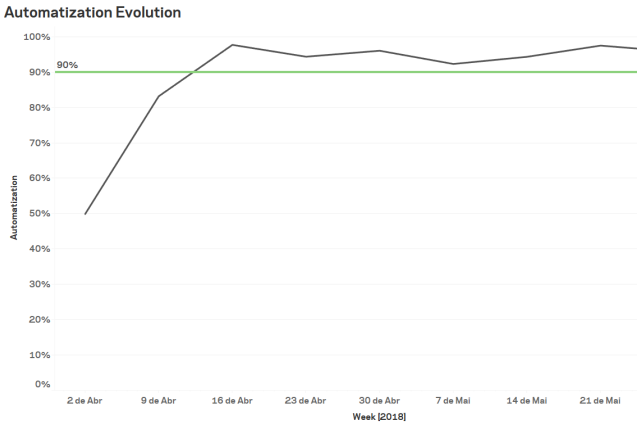

Figure 5.3: Tool Automatization Evolution

Savings

Savings, as the name suggests, comprehends the monitoring of the total amount of saved money and time per week, considering the dynamic tool accuracy and the execution time, as it shows the following equations 5.2 and 5.3.

$$Costs\ Savings = Number\ of\ exceptions \times Accuracy \times (Cost\ AS-IS - Cost\ TO-BE) \quad (5.2)$$

$$Time\ Savings = Number\ of\ exceptions \times Accuracy \times (Execution\ Time\ ASIS - Execution\ Time\ TOBE) \quad (5.3)$$

These metrics will allow a full control of the reduced cost and will also aid the time management of the team, considering the time saving. The next figure 5.4, represents the saving's monitoring since the end of March (when the tool started to be used) until end of May. Once time and costs are dependent on the same variables, the evolution of both has been similar in the past months.

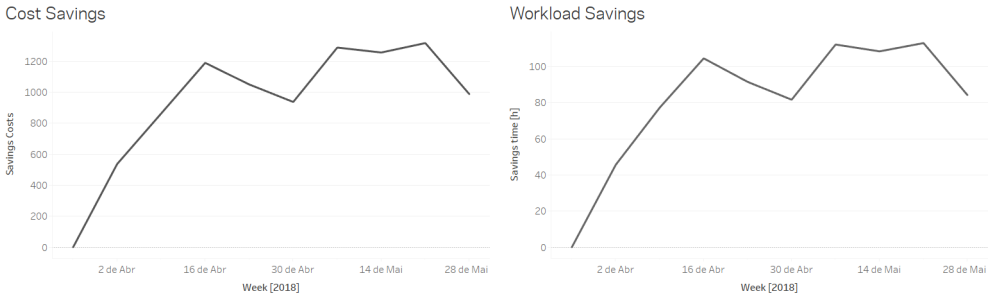

Figure 5.4: Cost and Time Savings

Workforce Allocation

According to the number of exceptions, the estimated execution time to submit them and the available work time, the Workforce Allocation metric evaluates the number of workers needed to perform the exceptions process per week, which is estimated based on the following equation 5.4. The established target corresponds to the average forecasted workforce: 1 worker.

$$WorkforceAllocation = N.exceptions \times \frac{Accuracy \times Exec.TimeASIS + (1 - Accuracy) \times Exec.TimeTOBE}{Total\ of\ weekly\ working\ hours} \tag{5.4}$$

The number of workers has been reduced since the tool implementation, as expected. This new metric has as main objectives to enable a better scheduling management and a strategic allocation of resources. The following figure shows the evolution of the metric from April until May 2018, figure 5.5.

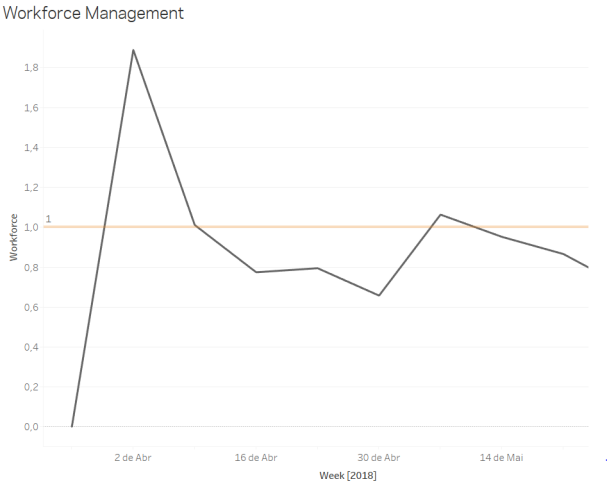

Figure 5.5: Workforce Allocation

5.2 Dashboards

According to sub-chapter 2.3, monitoring and controlling is the last stage of Business Process Management, revealing itself as a crucial component to maintain the process feasibility and guarantee its efficiency. Monitoring and controlling processes increase the visibility over the process and can be the trigger to detect patterns, anomalies, and opportunities to improve the current processes' performance. Thus, the monitor report must be functional, interactive, flexible and accomplish the established requirements, allowing the stakeholders to easily understand it. The requirements are listed below:

- Automatic daily data refreshment;
- Filtering features;

- Conditional Formatting;
- Drill-down features;
- Online publishing, allowing the stakeholders access to the information.

Considering the listed requirements and the available software in Farfetch, the reports were developed by using the Tableau software environment. The Tableau software covers all the above-mentioned requirements, since it enables automatic daily data refreshment and a total integration with SQL server and Microsoft Excel. In addition to the business analytics capabilities, it also has a wide range of data visualization features.

The main purpose of the reports is to support the exceptions management process and also to monitor the tool performance and outputs. Thus, 3 distinct reports to comprise all process needs were developed and listed below:

- *Exceptions Management: Workload and Flow*;
- *Boutique's Exceptions Performance*;
- *Tool Performance Monitoring*.

The aim of these reports was to aggregate the data allowing its easy manipulation of it and an intuitive visibility of the process in real time and whenever the user wants to analyze it. In order to guarantee it, the developed reports concerned some requirements, such as structure standardization considering the conditional formatting, filter features position and the drill-down capabilities. The general filtering features are positioned at the upper-left corner of the report and they are applied to all dashboards, though some specific dashboards can have their own filters at the top of the dashboard. Thus, the stakeholders can quick awareness about the available filter options. Due to their relevance, data filters are allocated across all the dashboards. Moreover, all the available filters have multiple drop-down values which means that the user can select a single or a range of options. Regarding the charts, the colors should remain the same whenever the information matches and the format should not vary from each dashboard.

Summing up, the dashboards will support all the exceptions process, ensuring the alignment of Farfetch's global operations by increasing all the involved teams perceptibly over the process, enabling a quick active detection of the patterns and weaknesses. Thus, improvement opportunities will emerge allowing the empowerment of the exceptions' process.

Exceptions Management: Workload and Flow

The principal aim of this dashboard is to monitor the current situation of the Sales Exception Management Menu. It assists the team, by highlighting the current backlog situation and enabling a detail view over the workload. Moreover, this report also allows the user to monitor the flow of the distinct exceptions. In addition to the date filters, the report can be filtered by: SoS Range (negative, positive or neutral), Order Code and type of exception.

Looking at the report, it is possible to have an immediate overview of the current exceptions workload by range, as well as the total number and the qualitative type of exceptions, represented in the figure 5.6. When explored deeper, the stakeholders can consult by range and status what are the correspondent order codes and the respective range (before and after solving the exception).

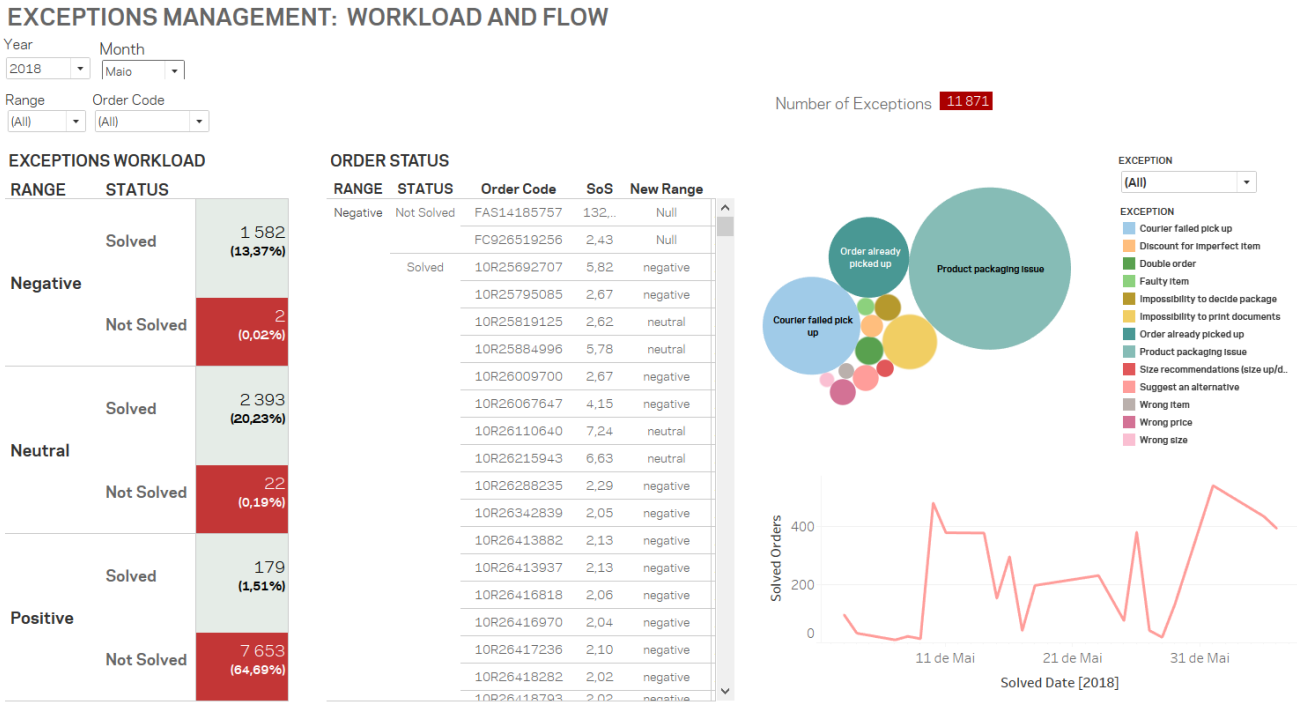

Figure 5.6: Exceptions Management: Workload and Flow I

The flow of exceptions in Sales Exception Management Menu is also monitored per day and month, figure 5.7 .

Figure 5.7: Exceptions Management: Workload and Flow II

Despite the upper-left filtering features, there is a drill down capability that enables the stakeholders to click in the intended information in the dashboards, filtering immediately all the report according to it. It simplifies the navigation in the dashboards and the data manipulation.

Boutiques' Exceptions Performance

The *Boutiques' Exception Performance* dashboard is based on Microsoft Excel tool and it aims to monitor the behavior of boutiques when creating exceptions. At first look, the stakeholders immediately get the big picture of the boutiques that created more exceptions, as it shows the figure 5.8. Allowing to filter by store, stock point, country and date of exception's creation, this dashboards also comprises dynamic filters, like the previous one, where the user can filter the intended information by clicking over it.

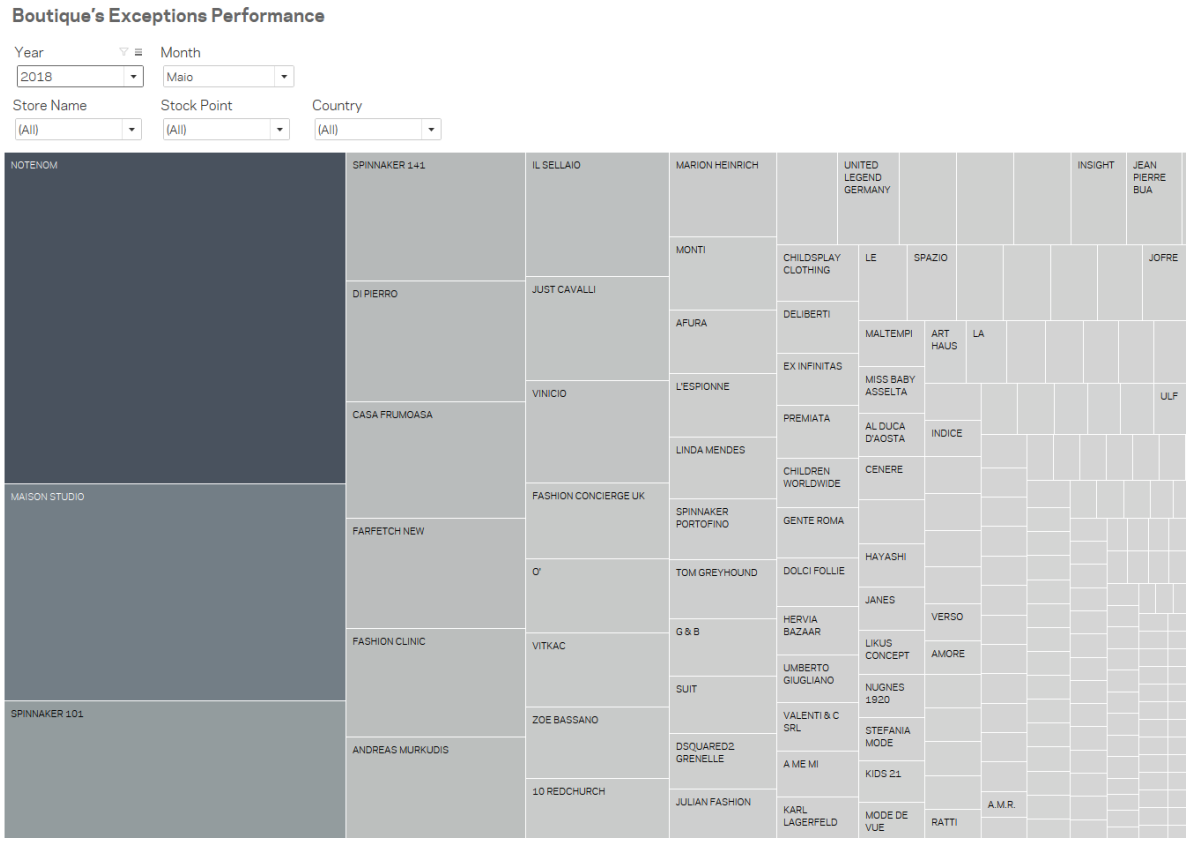

Figure 5.8: Boutique's Exceptions Performance I

Browsing into the dashboard, the stakeholders can quickly understand which are the outputs from Zendesk and Delivery Exceptions and organize them by quantity, being also possible to check the correspondent order codes in a right-side list, as shows the figure 5.9. Moreover, it is also possible to check which are the boutiques that are already taking time of the SoS, enabling to analyze if there are any created exceptions that are connected with this fact.

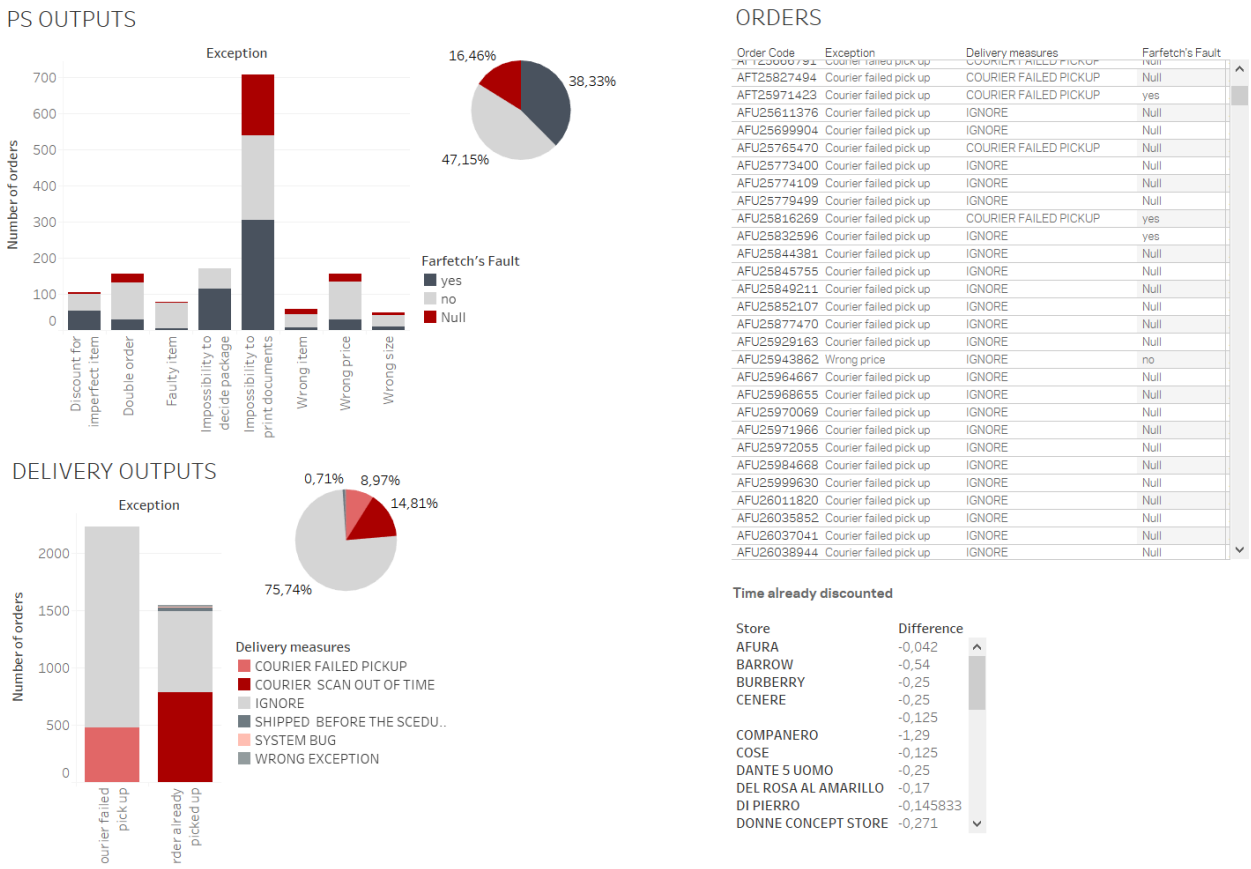

Figure 5.9: Boutiques' Exceptions Performance II

The exceptions creation flow by type can also be consulted in this dashboard. Thus, according to the outputs and the flow of exceptions there can be detected specific issues or even standards that need further process improvement. Since the goal of *Boutiques' Exceptions Performance* dashboard is to observe and analyze the way boutiques are creating exceptions, it makes sense to have a representation of the boutique's who create more exceptions with the wrong motive. So, the last dashboard represents the boutique's that reveal worst performance regarding exceptions. For this matter, it becomes easier to detect behavioral patterns, enabling to educate boutiques about best practices of exceptions' process, by showing examples of their wrong behavior. The following figure 5.10 represents the previous mentioned dashboards.

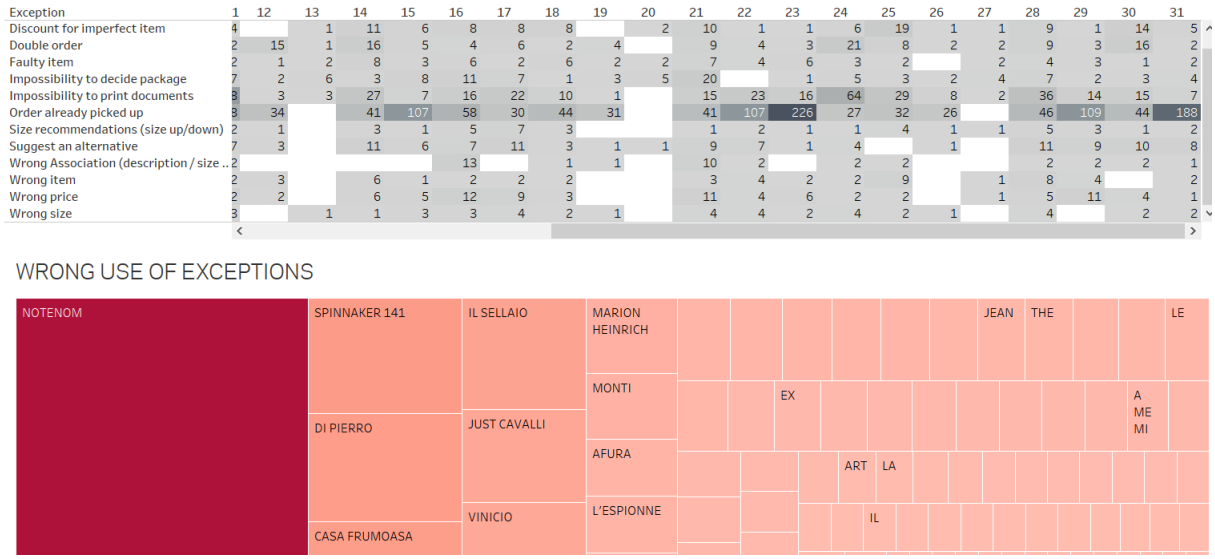

Figure 5.10: Boutique's Exceptions Performance III

Furthermore, this dashboard will not only help the Supply team to manage the boutiques and their global performance but it will also impact the daily work of PS team in a positive way, once they will have a tool to help them in boutique's training, reporting their bad performance in an intuitive graphical representation.

Tool's Performance Monitoring

The intent of *Tool's Performance Monitoring* is, as the name suggests, to monitor and control the tool performance accounting the total time and cost savings and also the % of tool's automatization. This dashboard also allows a full management of workload and workforce. The dashboards were based in the developed metrics described in previous the section 5.1.1.

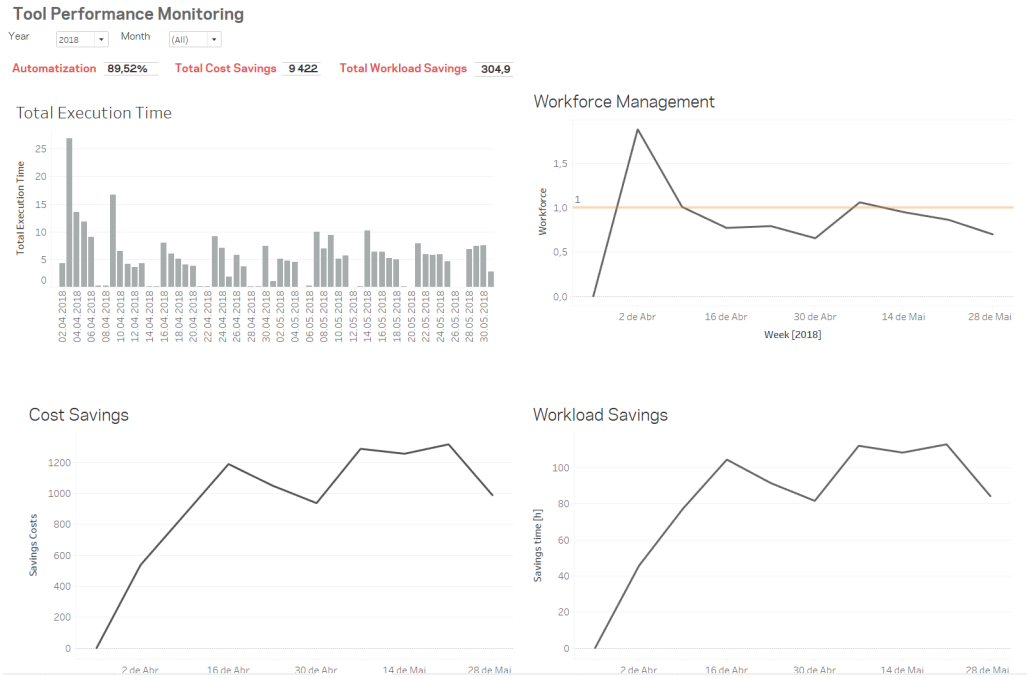

Figure 5.11: Tool's Performance Monitoring

By controlling the tool automatization, it becomes easier to detect any anomaly in the process of the existent, or even new exceptions. Moreover, the exceptions analysis task is assisted by the *Workforce Management* dashboard and *Total Execution Time* dashboard, which enables a strategic workforce planning.

5.3 Proof of concept

As a matter of proof the tool's efficiency and also the previous mentioned advantages of using the tool, a forecast model was developed, able to predict the time, costs and workforce needed considering two different scenarios: resorting the tool and not resorting the tool. Forecasting the exceptions will line up the Supply team resources scheduling the tasks according to the predicted demands. The forecast model considers:

- Sales growth;
- Seasonality;
- Exceptions' growth along the orders;
- Exception time execution;
- Available working hours;
- Operational costs in process;
- Tool accuracy and process automatization.

Historical data was used to forecast the exception's growth, according to seasonality, along with orders in the following months. The green elements of the figure 5.12 represent, the orders and exceptions' evolution in 2017 and in the first quarter of 2018 as well as its respective seasonality during the remaining months. Farfetch's orders have been growing 50% a year and, checking the data represented in figure 5.12, 3% of these orders have at least one exception associated. In general, the volume of exceptions per month goes along with the orders' volume, verifying a peak season in May, June, November, and December due to promotions such as Black Friday or Singles Day in China. Based on the 2017 results, it was predicted that the number of orders in 2018 will reach 4 176 441, including 116 652 orders with exceptions. As a result of the previous year seasonality, it was forecasted the exceptions distribution from May until December of 2018, as it is shown in figure 5.12.

2017	January	February	March	April	May	June	July	August	September	October	November	December	Total
Number of orders	221 690	148 844	181 372	162 806	303 503	268 427	264 184	183 394	171 176	193 604	396 779	288 515	2 784 294
Number of exceptions	5575	3311	5397	3756	8947	5297	4933	4669	3837	4573	10472	17578	78 345
Growth exceptions	3%	2%	3%	2%	3%	2%	2%	3%	2%	2%	3%	6%	3%
orders' seasonality	8%	5%	7%	6%	11%	10%	9%	7%	6%	7%	14%	10%	
Exceptions' seasonality	7%	4%	7%	5%	11%	7%	6%	6%	5%	6%	13%	22%	
2018	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Total**
Number of orders	361 303	227 343	253 393	289 935	455 255	402 641	396 276	275 091	256 764	290 406	595 169	432 773	4 176 441
Number of exceptions	9 658	5 132	6 349	9 615	13 322	7 887	7 345	6 952	5 713	6 809	15 592	26 173	116 652
Growth exceptions	3%	2%	3%	3%	3%	2%	2%	3%	2%	2%	3%	6%	
orders' seasonality	9%	5%	6%	7%	11%	10%	9%	7%	6%	7%	14%	10%	
Exceptions' seasonality	8%	4%	5%	8%	11%	7%	6%	6%	5%	6%	13%	22%	

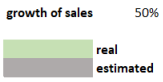

Figure 5.12: Exceptions' Forecast

Determining the expected number of exceptions for 2018, the impact of the exceptions process in operational costs, workforce and time spent executing them by the Supply team was measured, considering both scenarios. To proof the efficiency of the process several assumptions were made including operational costs, team workload, time execution, and estimated the process accuracy. As a result, the savings resources achieved by the tool, the impact of the tool on the process, and the total accuracy of it were assessed.

Workload

Considering the lunch hours and work pauses, the workload of a Supply team member is 7 hours a day, 5 days a week, 22 working days a month.

Time Execution

The process execution time depends on the resources and guidelines used to perform a task. For this calculation, the average time spent to solve an exception performing the AS-IS mapping and the TO-BE mapping was measured. Collecting performance samples from different workers, the average execution time is:

- Performing the AS-IS process not resorting to the tool: 0.05 h per exception which converted in minutes corresponds to 3 min.
- Performing the TO-BE process resorting to the tool: 0.01h per exception which converted in seconds corresponds to 40 seconds.

Operational Costs

As the platforms used, such as SALES, Zendesk and STORM, do not have additional operational costs, the only cost to consider is the annual average operational cost of a Supply Team member. According to the Finance team, a Supply team member represents, on average, $26 000 for the company. This annual value will be split by month, representing a cost of $2166 per month to the company.

Tool Accuracy

The number of unforeseen events and exception's orders are constantly changing and consequently the tool accuracy. Therefore, to estimate the costs of the process by using the tool, an average of 90% of tool accuracy was assumed during the 2018 year.

To sum up, the final assumptions used to forecast the process' costs are represented in following, table 5.1.

Table 5.1: Forecast Assumptions

Assumption	**Performing AS-IS**	**Performing To-BE**
Workload	7 hours/day and 22 days/month	7 hours/day and 22 days/month
Time Execution	0.05 exception/hour	0.01 exception/hour
Operational Costs	0.70$ /exception	0.14$ /exception
Accuracy	0%	90%

Thus, based on the previous assumptions and the number of forecasted exceptions, the required time to solve the amount of exceptions per month , the needed workforce and the total costs from April 2018 until December 2018 were estimated.

Figure 5.13 represents the overall process's costs, considering the both scenarios with or without the tool as a process support. It would represent an annual cost of $69 930 translated in 710 work days, and an average of 12 workers per month that may vary with seasonality.

On the other hand, performing the exceptions' process with the tool the volume of saved resources is evident. Considering the implementation of the tool on April, the results excepted, until the end of 2018, would be seen as a cost reduction from $ 69 930 to $19 021. The exceptions' time execution would also decrease to 193 days of work converting to an average of 1 worker per month. These results were raised always considering the tool accuracy of 90%.

Without tool	April	May	June	July	August	September	October	November	December	Total
Number of exceptions	9 615	13 322	7 887	7 345	6 952	5 713	6 809	15 592	26 173	**99 408**
Time to solve[days]	69	95	56	52	50	41	49	111	187	**710**
Workforce [worker]	10	14	8	7	7	6	7	16	27	**101**
Costs [$]	6 764	9 371	5 548	5 167	4 890	4 019	4 790	10 969	18 412	**69 930**
With tool	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Total**
Number of exceptions	9 615	13 322	7 887	7 345	6 952	5 713	6 809	15 592	26 173	**99 408**
Time to solve[days]	19	26	15	14	14	11	13	30	51	**193**
Workforce [worker]	1	1	1	1	1	1	1	1	2	**9**
Costs [$]	1 840	2 549	1 509	1 405	1 330	1 093	1 303	2 983	5 008	**19 021**
Total Savings	**4 924**	**6 822**	**4 039**	**3 762**	**3 560**	**2 926**	**3 487**	**7 985**	**13 404**	**50 909**
Total Saved Time	**50**	**69**	**41**	**38**	**36**	**30**	**35**	**81**	**136**	**517**
Total Workforce Saved	**9**	**12**	**7**	**7**	**6**	**5**	**6**	**15**	**24**	**93**

Figure 5.13: Estimated Savings after tool implementation

In conclusion, using the tool could represent a saving of $50 909 during the first 9 months, hence, a time-saving of 517 hours, which enable the reallocation of workforce in other potential tasks or even reducing the number of workers. The costs savings can reach the $149 553 by the end of 2019, reinforcing the tool's value for the Supply team. Supporting the operational alignment, the exceptions forecast will provide a better allocation of the resources, setting up the required workforce in a given month, which will allow a better management planning of the Supply team's tasks.

Chapter 6

Conclusions and Future Work

The luxury fashion e-commerce industry has been growing at a fast pace and so is Farfetch. Maintaining a sustainable and profitable growth requires structured and consistent processes that can support and strengthen the company's operations. Therefore, Farfetch has a constant need to exploit potential improvements in the current processes, re-designing them with further automatization.

As a result, the aim of this project was to re-design and automatize the exceptions' management process, following a methodology based on the Business Process Management methodology and fulfilling all the proposed requirements. The process was designed and re-designed, taking advantage of the main process weaknesses and leveraging the process guidelines to further automatization. Thus, a tool to assess the exceptions was developed enabling not only the automatic analysis of exceptions, but also the process monitoring.

The exceptions process was an unexplored subject within the company, representing a bottleneck of the Supply Chain team. A completely manual and unstructured process without guidelines or any documented information associated to it, was the definition of the process at the beginning of the project.

The process standardization, not only guaranteed its consistency, but also increased the Supply Chain team's visibility over the process, thus increasing the team's knowledge over it. Moreover, the automatization of the process allowed not only to increase the speed of the process, but also for the storage of all the information about the process in the same platform. Despite the increase of the exceptions workload, as a consequence of the continuous sales growth, the reduction of exceptions' performing time, achieved by the tool, meant a significant time saving for the Supply team and cost savings for the company. Furthermore, the tool enables full control of the process, supporting workforce planning and strategic resources allocation.

However, there was a need to translate the tool's outcome in a more visual way. Therefore, data visualization techniques were used to communicate the relevant information about the tool and the exceptions' process in general. As a result, the developed dashboards aim to ensure ef-

ficient process management and to guarantee the monitoring of the tool's behavior and of the exceptions' process, enabling all the involved stakeholders to quickly get acquainted with the process. Moreover, once the boutique's behavior is monitored and transmitted by a dashboard, it allows to support the PS team in improving the boutique's behavior.

However, the project faced some limitations. The impossibility to fully automatize the process was mainly due to the dependency of another entities, such as PS team and the 3PL involved, the lack of data and standardized data in the database.

Despite these limitations, the final outcome of the developed project was positive, corroborating the initial assumptions, translating into a saving of $21 683 until end of June and expecting to save $69 930 until the end of the year. This means that 710 hours of workload will be saved, due to reduction in time of exceptions' analysis performance. The exceptions process will no longer represent a bottleneck for the Supply team.

Although the final outcome of the project was positive, there is always room for improvement. Thus, the next step will be to fully implement the designed rules in the SALES. To do so, the proper guidelines comprising and specifying all the exceptions' rules must be integrated directly in Sales Exceptions Menu, enabling the automatic exception's analysis and selection of the range. It will require not only the alignment of the PS team, Supply team and Technology team, but also the boutiques that will undergo an intensive training about the creation of exceptions. However, to achieve the full automatization, all the stakeholders must be aware of the overall process and how it should be performed, mainly the boutiques who incorrectly create exceptions and the PS team who analyse the Zendesk one's. The fully integration of the exceptions management rules will take the exceptions process to the next level, encouraging the continuous improvement of the company's processes using the same approach.

In conclusion, the Supply team exception's analysis are now empowered with an assessment tool which ensures the automatic analysis of more than 90% of the total volume of exceptions being supported by data dashboards insights. The transparency of the communication flow engaged the stakeholders, increasingly motivated by the outcomes, prompting reactive and proactive actions and promoting the continuous improvement of the process.

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Appendix A

Mapping

The following appendix A.1, A.2 ,A.3 comprises all the mapped processes, including all the respective AS-IS and TO-BE models, since "Courier Failed Pickup", "Order Already Picked Up" until " Zendesk" exceptions, respectively.

A.1 Courier Failed Pickup

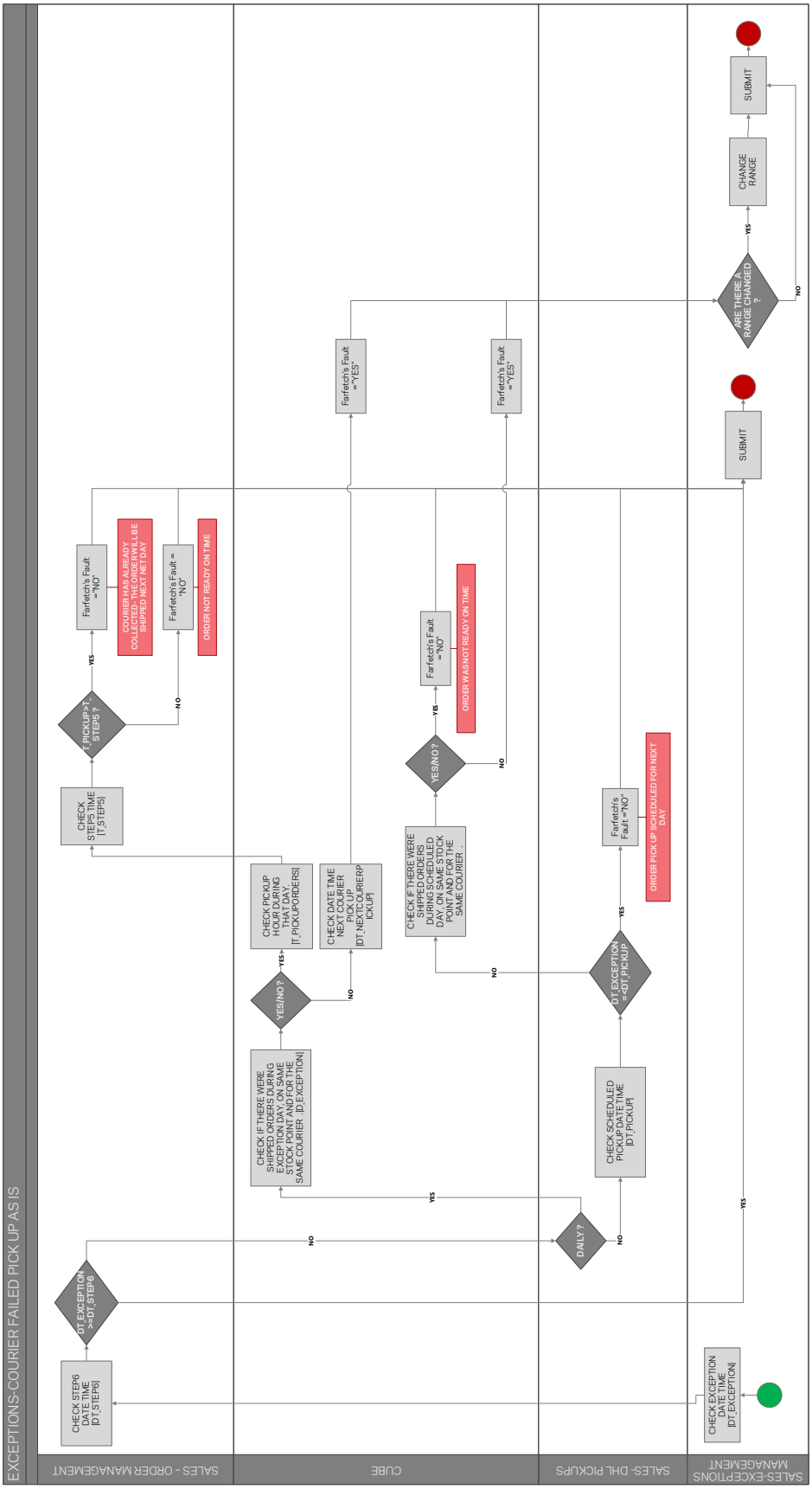

Figure A.1: Courier Failed Pickup AS-IS

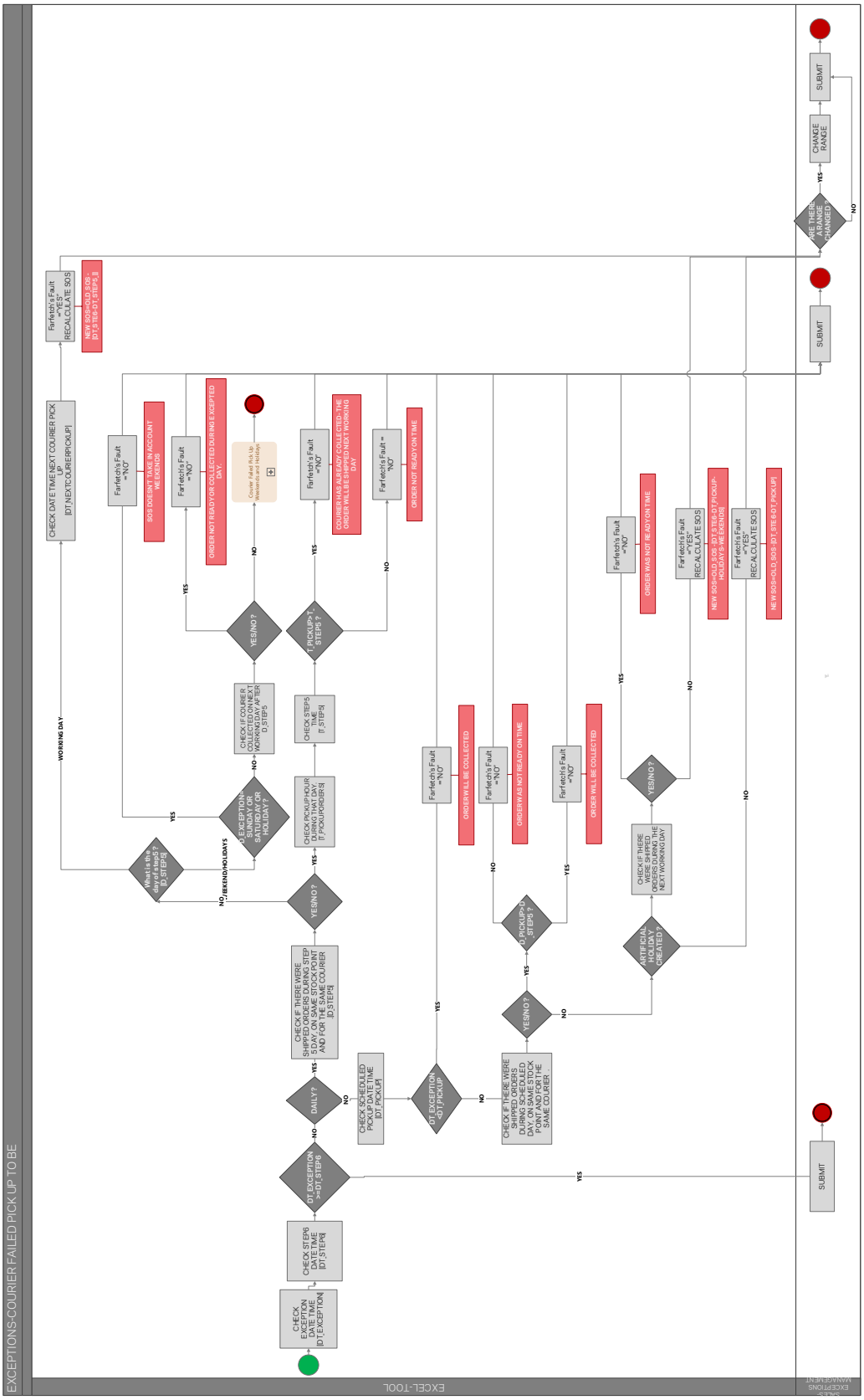

Figure A.2: Courier Failed Pickup TO-BE

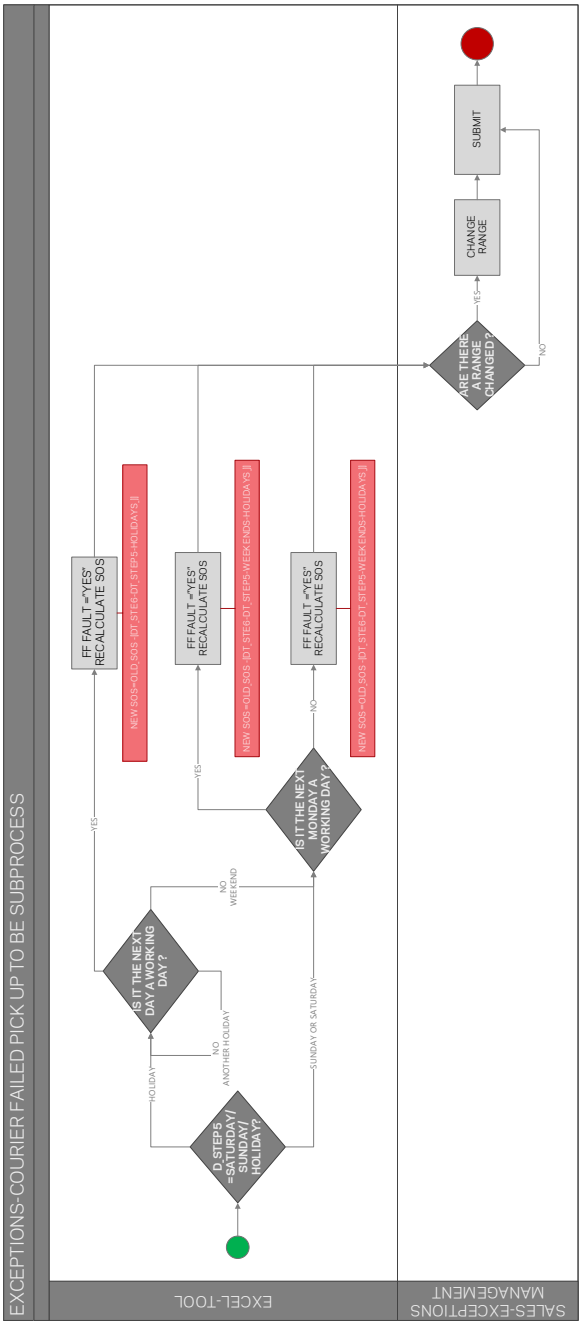

Figure A.3: Courier Failed Pickup TO-BE - Sub-process

A.2 Order Already Picked Up

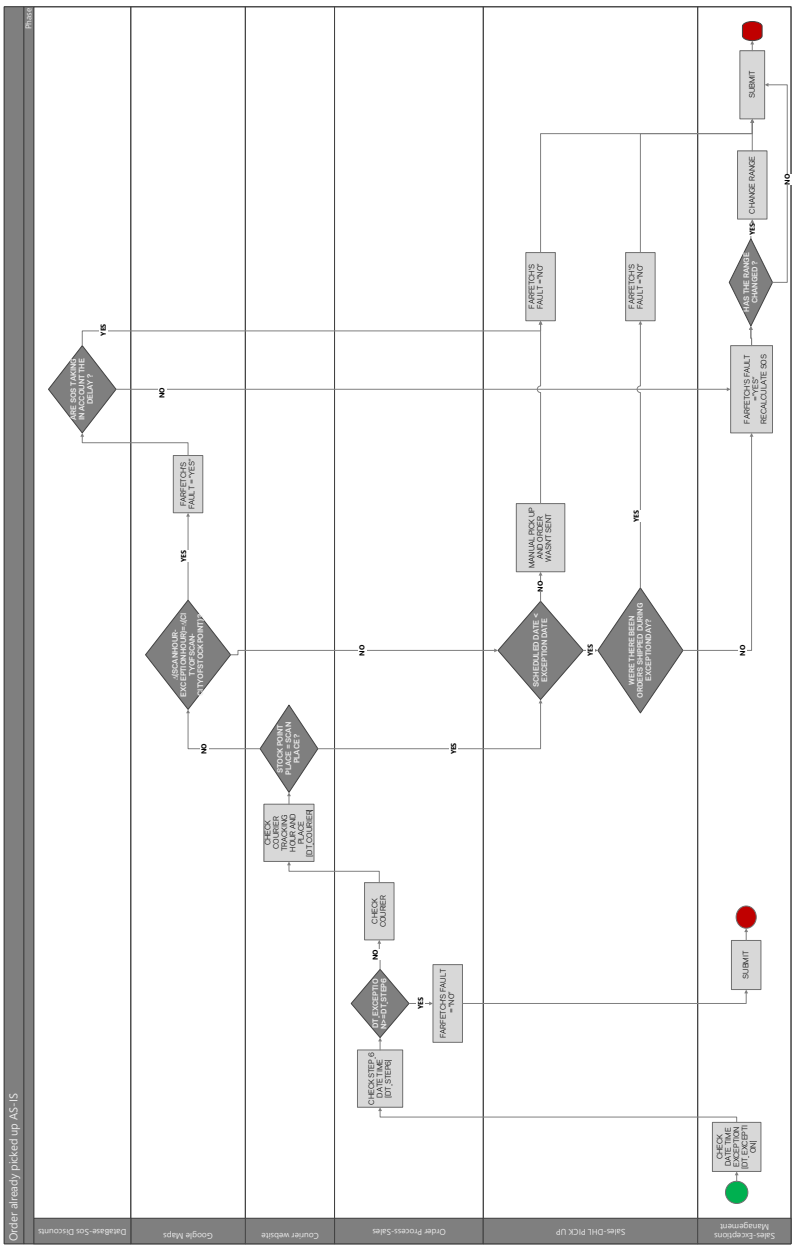

Figure A.4: Order Already Picked Up AS-IS

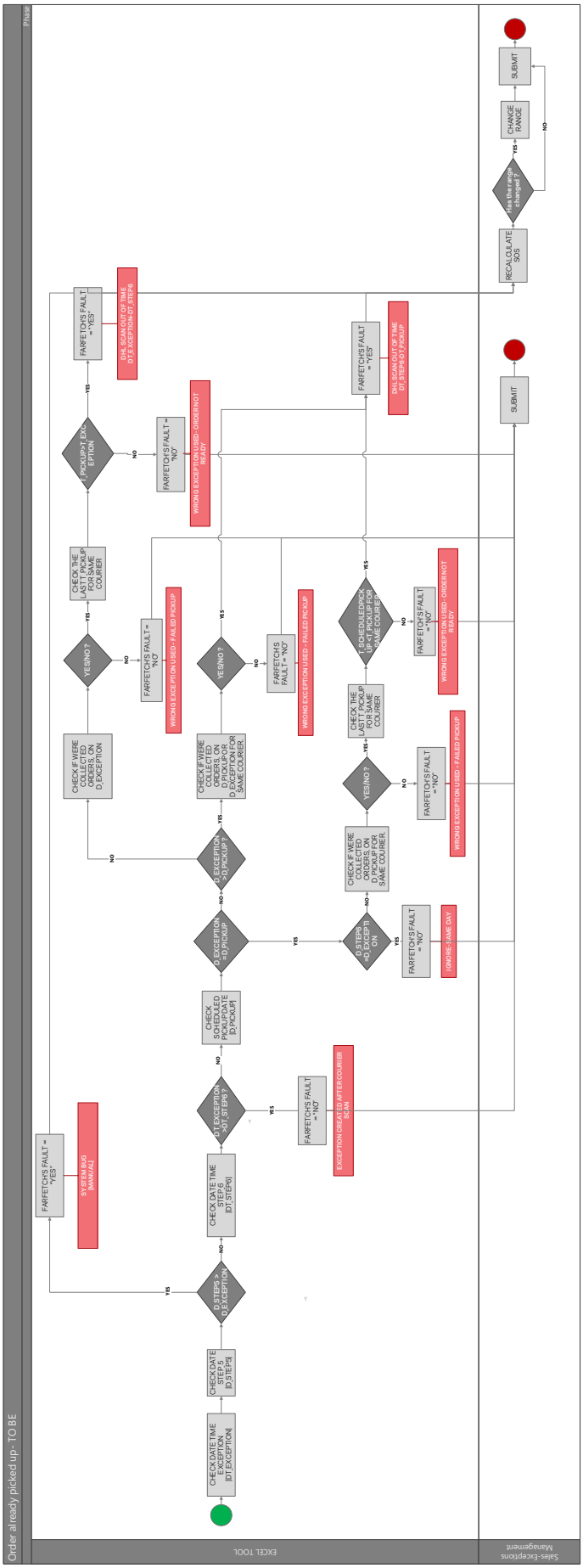

Figure A.5: Order Already Picked Up TO-BE

A.3 Zendesk

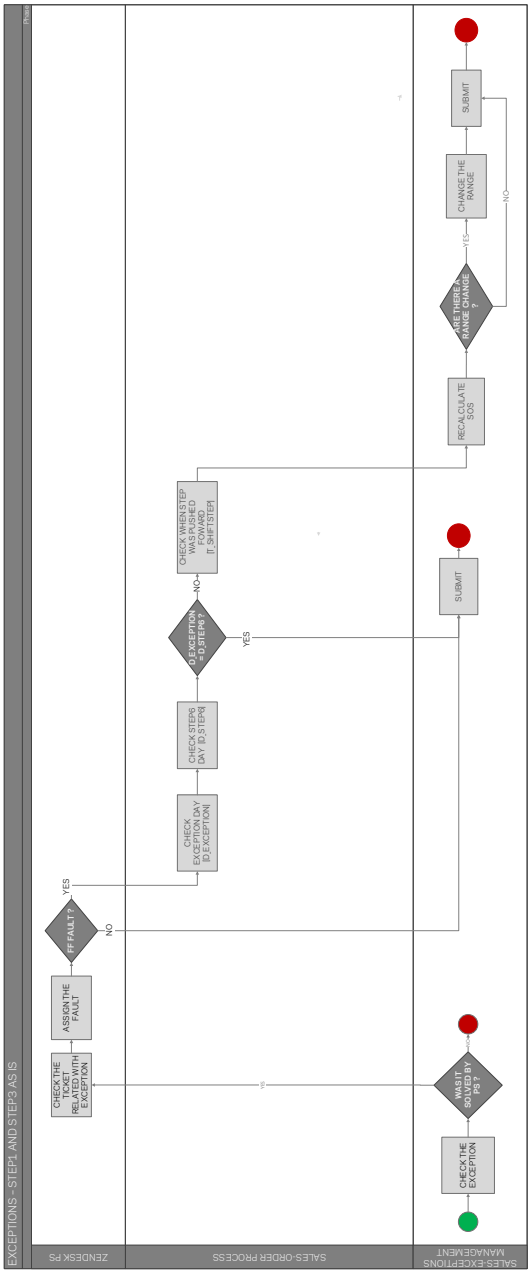

Figure A.6: Zendesk AS-IS

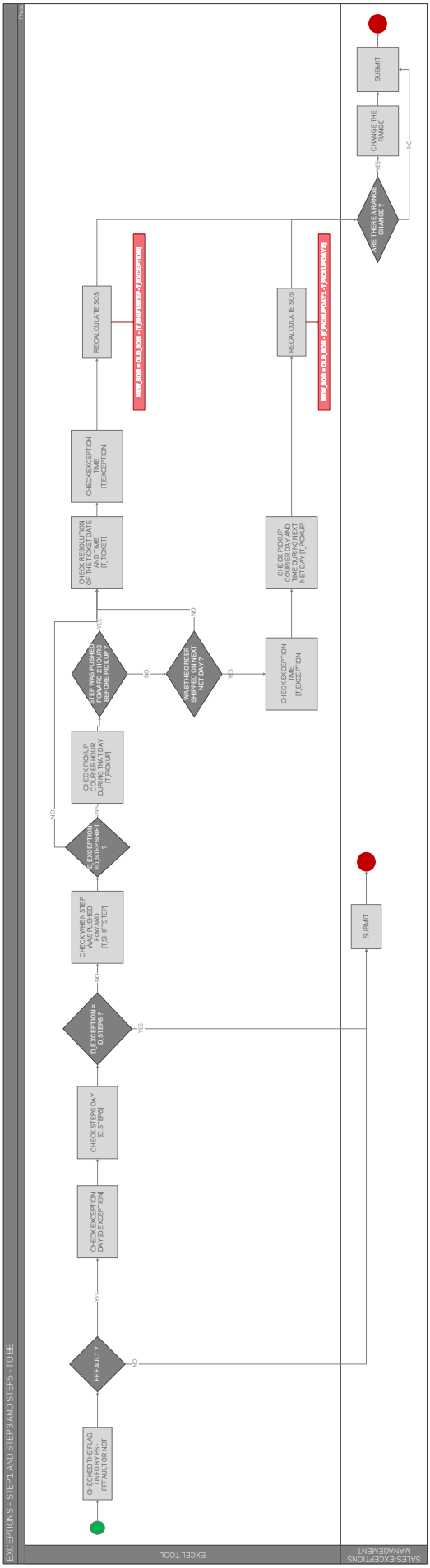

Figure A.7: Zendesk TO-BE

Appendix B

Queries

B.1 Exceptions' Main Query

```
Select distinct
bolocais.sigla + cast (o.orderID as varchar) as OrderCode
,ext.StoreName as StoreName
,bolocais.nome as StockPoint
,bp.nome as Country
,reasondesc.Description as Exception
,replace(replace(replace(event.Description,char(13),''),char(10),''),char(9),'') as notes
,CAST( o.datacriado AS DATE) AS DATACRIADO
,CAST(F2.DATE AS DATETIME) AS D_STEP1
,CAST(F4.DATE AS DATETIME) AS D_STEP3
,CAST(F5.DATE AS DATETIME) AS D_STEP5
,CAST(dateadd(hour,1,event.createdon ) AS DATETIME) AS D_exception
,DATEADD(hour,-t1.countrytzoffset,f6.date) as IStep6
,CAST(p.pickupdate AS DATETIME) AS D_pickup
,tracking.Descricao as Courier
,ticket.fffault as FFFAULT
,ticket.date_ps as DATE_PS
,ticket.time_ps as TIME_PS
,ticket.datetime_ps as DATETIME_PS
 ,(case
when  event.createdon <f2.date  then
bi_sync.dbo.NumberOfExceptionDays(event.createdon,
f2.date,bp.paisid,bolocais.localid,bolocais.localid)
when event.createdon >f2.date and event.createdon<f4.date then
bi_sync.dbo.NumberOfExceptionDays(event.createdon,
f4.date,bp.paisid,bolocais.localid,bolocais.localid)
end ) as step1_3holidays
,bi_sync.dbo.NumberOfExceptionDays(event.createdon,
f6.date,bp.paisid,bolocais.localid,bolocais.localid) as step6_expholidays
,bi_sync.dbo.NumberOfExceptionDays(f5.date,
f6.date,bp.paisid,bolocais.localid,bolocais.localid) as step5_6holidays
,bi_sync.dbo.NumberOfExceptionDays(p.pickupdate,
f6.date,bp.paisid,bolocais.localid,bolocais.localid) as step6_pickholidays
,dt.diff as diff

from glborders o
inner join bolocais on o.siteID = bolocais.localID
left join [OMSEvent] event (nolock) on o.siteID=event.siteID and o.orderID=event.orderID
left join [OMSReason] reason (nolock) on event.idReason = reason.IDReason
left join [OMSReasonDescription] reasondesc (nolock) on
reason.IDReasonDescription=reasondesc.idDescription
left join fardhlpickupsf p (nolock) on p.orderid=o.orderid AND p.localid = o.siteid
left join ( select idservico, descricao, left(descricao,3) as sigla from
 FarServicosUPS  ) tracking on tracking.IDServico=o.ShipType
left join vw_BI_ExtractStores ext on ext.siteID=o.SiteID
left join [BI_SYNC].[dbo].FarOrderLog f2 (nolock) on o.SiteID=f2.SiteID
```

```
and o.OrderID=f2.orderID and f2.LogType = 87  -- Status change:Stock OK
left join [BI_SYNC].[dbo].FarOrderLog f4 (nolock) on o.SiteID=f4.SiteID
and o.OrderID=f4.orderID and f4.LogType = 77  -- status Change: Package OK
left join [BI_SYNC].[dbo].FarOrderLog f5 (nolock) on o.SiteID = f5.SiteID
and o.OrderID = f5.orderID and f5.LogType = 34  -- Status Change: Ready to Send
left join [BI_SYNC].[dbo].FarOrderLog f6 (nolock) on O.SiteID = f6.SiteID
and O.OrderID = f6.orderID and f6.LogType = 85  -- Status Change: Sent
left join [BI_SYNC].[dbo].bopaises bp(nolock) on bp.paisid=bolocais.paisid -- country
inner join [BI_ETL].[dbo].[DimGeographyCountryTZOffSet] t1
on t1.countryid=bolocais.paisid -- Timezone
inner join [BI_REPORTING].[dbo].[Tableau_TenantDates] t (nolock) on t.tenantid=o.tenantid
left join(

 SELECT DISTINCT zdt.ID as TICKET
     ,aa.orderid
     ,aa.store as store
     ,zdt.status
     ,LEFT(SUBSTRING(zdt.Description,CHARINDEX('Reason:␣',
     SUBSTRING(zdt.DESCRIPTION,1, 999),1) ,999),
     CHARINDEX('␣Notes', SUBSTRING(zdt.DESCRIPTION, 121, 999),1) ) as exception
     ,SUBSTRING(custfields.value,10,999) as FFFAULT
     ,cast(DATEADD(hour,1,zdt.createdat ) as date) as DATE_PS
     ,convert(varchar(5),DATEADD(hour,1,zdt.createdat),108) as time_PS
     ,cast(DATEADD(hour,1,zdt.createdat) as datetime) as DATETIME_PS

             FROM [BI_ZENDESK].[dbo].Zendesk_Tickets zdt

left join (select distinct  taa.id as id , taa.ticketid, taa.[AccountId],min(taa.CreatedAt) as date_ps
          from  [BI_ZENDESK].[dbo].[Zendesk_TicketAudits] taa
         group by taa.id, taa.ticketid,taa.[AccountId])ta
         on ta.id = zdt.ID  and ta.[accountId]=zdt.[AccountId]-- last date

inner join (select  xxx.ticketid , substring (xxx.value,1,3) as store,
             substring (xxx.value,4,99) as orderid
     from [BI_ZENDESK].[dbo].[Zendesk_TicketsCustomFields] xxx
     where xxx.customticketfieldid = '26603525'
     and xxx.value is not null ) aa on aa.TicketID = zdt.ID -- ordercode

 left join [BI_ZENDESK].[dbo].[Zendesk_TicketsCustomFields] custfields (nolock)
     on custfields.[TicketID]=zdt.ID
     where zdt.accountid = 4
           and zdt.subject  like 'New␣Exception%'
           and zdt.createdat >'2018-04-09'
           and custfields.customticketfieldid='360000116189'
           and custfields.value is not null
           and (zdt.status='solved' or zdt.status='closed')
           and orderid not like '\%[a-z]\%') ticket on ticket.orderid = o.orderid

 left join (select exc.siteid as siteid, locais.Nome,
            exc.[ImpactType], exc.Diff as diff ,
    case when exc.CourierID = '10' then 'DHL'
    when exc.CourierID = '1' then 'UPS' end as Courier
    from [analysts].[dbo].[z_BI_AuxOperationsExeptions] exc
    inner join [BI_SYNC].[dbo].bolocais locais on locais.localid=exc.siteid
    where exc.ImpactType='SoS') dt on
    bolocais.localid=dt.siteid and tracking.sigla=dt.courier

where

bolocais.paisid not in (216,28,36)
 and f6.date > '2018-05-01'
and reasondesc.IdDescription in (5,6,7,8,9,12,17,18,19,21,22,23,27,30,40,41)
and reasondesc.description is not null
and t.tenantid='10000'
```

B.2 SoS Query

```
 Select  distinct
```

```
   ,OrderCodeId
   ,store.storename
   ,cast( fol.DateStep5_DHL_GMT as datetime) as sent
   ,[SoS_withoutWeekendsHolds_days] as sos_net

   FROM [BI_DW].[dbo].[FactOrdersLines] fol
inner join[BI_DW].[dbo].Dimstore store on store.localid = fol.siteid
 where
    tenantid='10000'
  and fol.DateStep5_DHL_GMT >= '2018-05-01'
  and store.regiontargetff not in ('US','BR')
  and FOL.[SoS_withoutWeekendsHolds_days] <> 0
```